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The Construction of Blended Foreign Language Learning Community Based on Computer Big Data Technology

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Abstract: With the advancement of computer technology and the advent of the big data era, students' lifestyles and mindsets have undergone significant changes. Currently, English classroom instruction primarily follows traditional teaching models, making it challenging to achieve optimal educational outcomes. This study argues that college English teaching in the era of computer big data requires further expansion in teaching content, teaching modes, teaching equipment, and teaching methods. The collaboration between students and teachers will form a blended foreign language learning community. Prior to adopting this approach, students frequently scored below 80. After implementing this method, student scores ranged from a high of 88 to a low of 71. The approach discussed in this article can enhance learning performance and represents the current trend in English teaching reform.

Keywords: Computer Big Data; Blended Learning; Foreign Language Learning; Professional Community; Model Construction

1. Introduction

If we take college English as an extension of English teaching, continue to use the original teaching content, adopt old teaching methods and old teaching equipment, it obviously cannot meet the needs of modern college students. At the same time, the massive data generated by various computer software terminals based on the network will have a great impact on English learning. This article holds that teachers and students can share resources through learning communities to achieve the synergy of teaching objectives.

The purpose of this article is to guide teachers to skillfully use computer information technologies such as intelligent teaching platforms and big data platforms to conduct accurate teaching, share high-quality teaching resources by using a blended foreign language learning community, and strengthen online and offline interaction, so as to improve the quality of education and teaching.

The main contents of this article are as follows: The first part introduces the background and significance of the construction of a blended foreign language learning community based on computer big data technology. The second part introduces related work. The third part introduces the blended foreign language learning community construction method. The fourth part analyzes the results and discussions. The fifth part summarizes the conclusions.

2. Related Work

Blended foreign language learning communities integrate learners and teaching assistants into one system, enabling them to share learning resources, communicate, and collaborate on learning tasks within the same learning framework. This integration promotes their growth and development. Zhang et al., based on the construction of learning communities in provincial-level excellent courses, summarized the functions and effects of "professional learning communities" on foreign language teachers [1]. They did this by analyzing reflection logs of six senior foreign language teachers and observing classroom teaching, highlighting aspects such as self-development awareness, teaching autonomy, and development autonomy.

For instance, Xu analyzed the importance of learning community construction in primary school English teaching, particularly in developing the learning abilities of disadvantaged groups within the class [2]. Wu believes that the establishment of a "learning

community" aims to position children as the primary managers of their learning [3]. He conducted a series of explorations by constructing a learning community tailored to the realities of his English classroom.

From an educational ecology perspective, Zhu interprets the ecological factors and their imbalances in current college English classrooms, utilizing the matching college English classroom learning community to address these issues [4]. According to Ma, the use of "learning communities" can promote the professional growth of college English teachers [5]. Zhang argues that classroom teaching methods based on learning community theory should create an equal, interactive, and dialogical classroom environment, aligning with the "student-oriented" approach [6]. However, their research did not explore the integration of computer big data technology and thus lacked technical support.

Albakri et al. and Chuah et al. emphasized that college English teaching should not only cultivate students' English skills but also their application abilities and overall English proficiency to adapt to today's diverse societal needs [7,8]. According to Fathi and Derakhshan, establishing a "blended foreign language learning community" classroom teaching model can stimulate students to learn English independently and actively [9]. This model ensures that students acquire more English knowledge, fulfills the purpose of English education, and promotes innovative development and reform in English classrooms, which is of great significance.

3. Methodology

3.1 Construction of Blended Foreign Language Learning Community

3.1.1 Teaching content

The college English teaching model based on English skills and language knowledge can no longer meet the needs of modern college students. The historic task of college English teaching is coming to an end. In this new era, many college students' enthusiasm and interest in English learning have declined, and the development of English has also stagnated [10,11]. One of the main reasons is that the current primary English teaching mode in colleges, similar to that in middle schools, can no longer adapt to the new generation of college students. Nafissi also stressed that this indicates that college English teaching has entered a new period of development [12].

With the rapid development of the social economy, societal requirements for English are constantly improving, and the teaching methods of universities are continuously evolving. However, at this stage, due to the lack of teachers, bilingual teaching cannot be implemented in college English major courses. For instance, through the statistical analysis of big data, the professional vocabulary learned by students can be effectively connected with the common knowledge of their majors. This model cannot replace the role played by general listening, speaking, writing, and reading in the process of foreign language learning [13,14]. English is actually a comprehensive course, which is much broader than specialized English textbooks, requiring targeted adjustment of English textbooks for different majors.

To address this, there must be a transition to ensure that existing English teachers are neither at a loss nor required to be trained as compound talents in English. For example, if a student is in the music department, English vocabulary relevant to music can be integrated into the English class through big data. This integration will not overly burden teachers but will make them more effective in future courses. After all, there are numerous words in English [15].

In addition, in many frontier fields, English remains the designated language for academic articles. Rido suggested that it is crucial to understand the development trends of English [16]. In this context, students can use English as an auxiliary tool for various courses, which can strengthen their expertise, satisfy their interests, adapt to future trends of internationalization, and stimulate their curiosity. This approach will foster a strong interest in English learning among students who have completed English as a subject and promote it to a new level. According to Rose et al. and Sevy-Biloon et al., this integration of language teaching with subject knowledge improves students' English proficiency [17,18].

3.1.2 Teaching mode

Collaborative teaching mode creates a cooperative and democratic learning environment for learners. In this atmosphere, students can collectively discover and explain

the rules and structures of language and the knowledge they encounter directly. The learning community is based on the common learning tasks of its members, aiming to promote their all-round development. As a carrier, the cooperative learning mode, organized around groups, allows students to work together, enabling each team member to fully utilize their strengths, develop a strong interest in their learning, and enhance their classroom participation.

Group members engage in tasks together, communicate directly, help each other, share various learning resources, and collaborate to complete learning tasks. Through mutual support and collaborative learning, a harmonious relationship between teachers and students can be established, transforming the monotonous atmosphere of traditional classroom teaching and fostering positive student development. In the long run, this approach is also a valuable experiment.

Generally speaking, the traditional teaching method of college English is no longer suitable for the current teaching situation, as it fails to stimulate students' enthusiasm and interest in learning. According to Shamsitdinova's findings, adopting a learning community approach and encouraging students to actively participate in teaching activities through common learning tasks can achieve better results and improve the effectiveness of English teaching [19].

3.1.3 Teaching facilities

Multimedia classrooms currently lack the capability to interact with other smart devices, such as the mobile phones that many students now use. The usage of these classrooms remains relatively basic, with English teachers primarily using courseware without fully utilizing the multimedia functions. Additionally, teaching software and equipment often fail to keep pace with the upgrading of hardware facilities. Although multimedia teaching is implemented in form, it has not significantly changed from traditional blackboard teaching, which does not contribute to creating an improved English learning environment for students.

According to the findings of Sifakis, English teachers in colleges and universities should aim to meet the specific needs of English majors by building a localized English teaching and learning resource library [20]. This approach

would enable the multimedia teaching platform to reach its full potential by creating localized teaching platforms and courseware. College English teaching should shift from a "teacher-centered" approach to a "student-centered" blended foreign language learning community. However, the traditional arrangement of desks and chairs can no longer accommodate this new "student-centered" teaching method.

Therefore, university classrooms should have desks and chairs that can be moved and assembled freely to adapt to the new teaching mode of a blended foreign language learning community. This arrangement facilitates cooperation among members to complete learning tasks effectively.

Data mining is a process of discovering hidden, previously unknown and useful information from a large amount of data. The accuracy of the data mining model can be calculated by the following formula:

$$ZQ = (TP + TN) / (TP + TN + FP + FN) \quad (1)$$

Among them, TP represents the number of samples that are actually positive cases that are correctly predicted as positive cases. TN represents the number of samples that are actually counterexamples that are correctly predicted as counterexamples. FP represents the number of samples that are actually counterexamples and are wrongly predicted as positive examples. FN represents the number of samples that are actually positive examples and are wrongly predicted as counterexamples. By calculating the accuracy, the performance of the model can be evaluated.

Collaborative filtering is an algorithm for personalized recommendation based on the similarity between users. Calculating the similarity between two users:

$$S(A, B) = \cos\theta(A \cdot B) / (||A|| * ||B||) \quad (2)$$

Among them, A and B are two vectors, which represent the feature vectors of two users' interest in foreign language learning or learning behavior. $||A||$ and $||B||$ represent the norms of two vectors. The calculated similarity can be used as the basis of recommendation algorithm in collaborative filtering algorithm, and provide personalized learning resources or learning partner recommendation for learners.

3.1.4 Learning tools

With the advancement of technology in recent years, multimedia equipment has been installed in the classrooms of colleges and universities,

and many institutions have established language experiment centers. These centers allow students to develop their listening, speaking, reading, and writing skills and to take mock tests. The advent of the big data era has revolutionized learning methods. The autonomous learning model in a big data environment is based on second language acquisition theory and autonomous learning theory.

Currently, the "Composition Review Network" has enabled the automatic marking of English compositions. It can automatically detect, judge, and evaluate students' English compositions objectively and accurately, providing scores and even comments sentence by sentence. This tool significantly enhances students' English writing skills. The "Composition Review Network" also helps English teachers by reducing the workload associated with correcting compositions, allowing students to engage in better self-correction and focus more on writing instruction.

English learning software, leveraging big data, can assess students' vocabulary levels and provide them with appropriate vocabulary lists. When students memorize words, the software skips previously memorized incorrect words, reinforcing the memory of these words and enabling students to study vocabulary anytime and anywhere using their mobile phones. Additionally, numerous listening practice applications are available for both mobile phones and computers. Different learners can share resources and access their preferred English programs according to their needs.

With mobile phone recording systems, students can record their spoken English and make timely corrections. For English reading, a vast array of English news articles and magazines are accessible on college students' smartphones. These platforms recommend content based on users' reading habits, thereby increasing their reading interest.

3.1.5 Construction path of blended foreign language learning community

(1) Updating the teaching concept

Based on the theory of a "people-oriented" learning community between teachers and students, the ultimate goal of learning should be to promote students' personality development and their physical and mental health. To stimulate students' learning potential and foster self-reconstruction, students must be given ample space for independent development in practice.

In foreign language teaching, this requires a shift from the concept of "teaching for the sake of teaching" to "teaching for the sake of learning". Foreign language instruction is inherently practical, and its "de-objectification" is crucial for achieving maximum teaching effectiveness. Guided by this idea, various online and offline teaching interaction activities should be implemented to enhance the learning experience.

(2) Improving teaching mode

This study took comprehensive English course as an example, the "Pre-class Preview Task List" was adopted and published on the online teaching platform, which includes existing platforms such as "Superstar Learning Platform" and massive open online courses (MOOCs).

In the first stage, students were required to complete the study of relevant videos and teaching materials on time according to the assigned homework. During the teaching process, teachers provided appropriate guidance based on the teaching focus of each unit and assess students' preview effectiveness through various interactive activities.

In the second stage, students engaged in output-oriented learning independently, such as oral training. Simultaneously, teachers offered relevant learning suggestions and feedback to help students improve. Throughout this process, teachers acted as facilitators, ensuring that both online and offline interactions allow everyone to track students' learning progress and effectiveness through discussion and collaboration. This model enabled students to learn more freely, actively, and innovatively.

(3) Developing up teaching resources

In order to meet the needs of online education and learning, the school completed the compilation of the new edition of foreign language teaching materials through extensive preparation and development. These materials were then applied to both online and offline teaching practices. Building on this foundation and utilizing existing online open courses, this article planned to further develop a foreign language professional training resource library. This resource library was composed of lecture videos recorded by teachers, training videos jointly completed by teachers and students, interview videos, examination questions, open

discussion assignments, situational training cases, and exemplary students' works.

(4) Reforming the teaching evaluation system

On this basis, a teacher and student group evaluation system suitable for the blended teaching mode was constructed. This system integrated quantitative evaluation with qualitative assessment and combined formative evaluation with diagnostic evaluation.

Online evaluation included metrics such as textbook assessments, unit tests, homework completion rates, discussions on online platforms, and online written tests. Offline evaluation encompassed attendance, self-evaluation, peer evaluation within groups, teacher evaluations, and group internships.

The purpose of this article was to address the issues inherent in traditional teaching evaluation systems and the subjectivity of conventional English tests, leveraging computer big data technology to better reflect students' teaching and learning efficiency.

4. Results and Discussion

4.1 Analysis of Students' Interest in Learning

This article investigated students' interest in English learning from three perspectives: grade difference, gender difference, and teaching content difference, using SPSS (Statistical Package for the Social Sciences) software to process and analyze the data. To account for varying interests in English learning, the researcher sampled three grades across three schools, collecting 300 questionnaires: 100 from freshmen, 100 from sophomores, and 100 from juniors.

The data revealed that 60% of freshmen, 50% of sophomores, and 30% of juniors were very interested in the teaching model. The statistics of students' interest in English learning across different grades are presented in Figure 1.
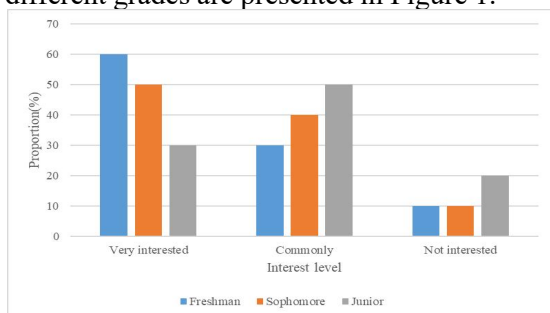

Figure 1. Students' Interest in English Learning

When the teaching content was engaging, the statistics of students' interest in English learning showed a marked improvement, as presented in Figure 2. Specifically, 70% of freshmen, 66% of sophomores, and 52% of juniors were very interested in the teaching content. This data indicates a notable increase in students' interest in English learning when the content is designed to be more engaging.
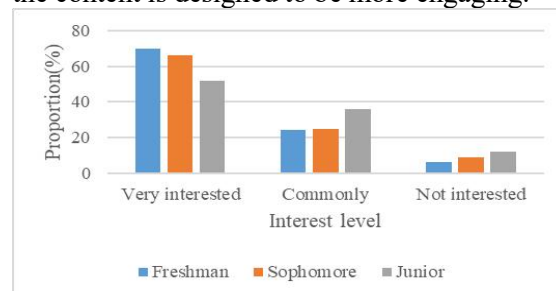

Figure 2. Students' Interest in English Learning with Engaging Content

In English classes, the proportion of students adopting cooperative learning was typically 33.10%. However, student participation remained relatively low, with 53% of students never voluntarily expressing their opinions—more than half of the class. Additionally, the rate at which students gained substantial knowledge from group discussions was very low, at only 20%. This indicates that, despite frequent participation in English teaching, students' engagement and learning efficiency were not high. Therefore, further improvements are necessary in the process of group cooperative learning. The statistics for regular meetings, occasional meetings, and never meeting in different survey contents are shown in Table 1.

Table 1. Results of Meetings Frequency

Items	Often (%)	Occasionally (%)	Never (%)
Collaborative learning	42	35	23
Participation level	27	20	53
Gains in the participation	20	32	48

4.2 Students' Scores

The comparison of students' scores before and after adopting this method is shown in Figure 3. Before the adoption of this method, the students' scores did not reach 80 points in 10 instances. After the adoption of this method, the students' scores ranged from the highest of 95 points to a lowest of 71 points.
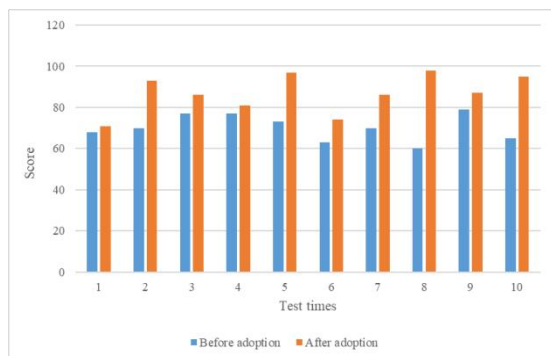
Figure 3. Students' Scores Before and After Method Adoption

5. Conclusion

This article establishes a blended foreign language learning community based on computer big data technology, which sets new requirements for the relationship between teachers and students. It advocates for the continuous integration of online and offline activities, aiming to create an equal, supportive, communicative, and harmonious learning environment. This environment will enable both teachers and students to learn and grow together with greater satisfaction.

The development of students' knowledge structure and literacy is a continuous and dynamic process. Therefore, the time and space for learning and reflection between students, and between teachers and students, should not be static. It is essential to expand the opportunities for learning and reflection and to create a continuous learning environment within this learning community.

Acknowledgments

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