Personalized Teaching Model of College English Based on Big Data

Ruiting Zang1,*, Liying Wang2
1Xianyang Normal University, Xianyang, 712000, Shaanxi, China
2Xiangshan Senior High School, Hancheng, 715400, Shaanxi, China
*Corresponding author E-mail: zrting532@xyun.edu.cn

Abstract. With the progress of the times and the development of economy, the state and society put forward higher requirements for talents, and college students, as the main force of socialist construction, are expected to be higher. The society requires college students to have higher comprehensive quality, more and more occupations and posts put forward higher requirements for college students' English ability, and the market economy needs more workers with excellent English ability. The international trend of education also requires college students to have excellent language skills, especially English as a second official language. With the further development of economic globalization, more and more international cooperation and more frequent cultural exchanges, society needs more English talents, and the ability to use English effectively reaches 90%, and the ability of cross-cultural communication reaches 90%. This is an important part of personal progress.

Keywords: Big data, college English, personalized teaching, media

1. Introduction
English is a common language and plays an important role in international political, economic, trade and information exchange. The study said: "Twenty percent of the world's people can communicate in English to some extent, and two-thirds of those engaged in scientific research can read English." In recent years, with the further internationalization of China's social economy, this number has increased unabated, which shows that learning English well is not only a personal need, but also a global need. With the increasing of international communication and cooperation, the role of English is becoming more and more prominent, and the state and society have put forward higher requirements for college students' English proficiency. However, the present situation of English teaching in colleges and universities in China is worrying.

The individualized teaching mode of college English based on big data has attracted the interest of many experts and has been studied by many teams. For example, some teams have found that humans include at least eight kinds of intelligence, such as language intelligence, spatial intelligence, interpersonal intelligence, logical intelligence, motion intelligence, natural observation intelligence,
introspection intelligence, etc. People belong to different types of wisdom, so they will show some differences in learning needs, thinking methods and learning means. If we see the individual differences of students in teaching, we will adopt individualized teaching strategies. The teaching effect will be more obvious. This theory emphasizes respect for individual differences and holds that students of different types of intelligence can receive good educational within a certain range[1]. Zhao Chunxi explored the possibility of combining the characteristics of the MOOC model with the reform of college English teaching in China. He believes that the advantages of the MOOC Internet have broken through the regional limitations of higher education, but the feasibility of language learning skills training still needs to be further explored. On the one hand, learners are eager to make full use of network resources to improve learning efficiency. On the other hand, English learning itself requires the particularity of individualized cultivation. How to find the best balance between the two is the process of fully combining theory with practice[2]. Also, many scholars study individualized teaching strategies from the perspective of improving teaching effect. They believe that individualized teaching should first consider six basic elements: the dual role of teachers, mentors and consultants; the diagnosis of students' learning characteristics; the cooperative culture of schools; the interactive learning environment; flexible time and progress; real evaluation [3]. Based on this, the implementation of effective individualized teaching depends on two continuous conditions: teachers, teaching resources, the level of interaction between teaching environment and learners, and the effectiveness of learners' applied knowledge and skills. The individualized teaching strategy adapted to these two continuous conditions is summarized [4]. First, individualized teaching; second, promoting learning for "poor students"; third, stylistic teaching; fourth, technical assisted learning; fifth, contract learning; sixth, real life teaching; seventh, guiding experiments; eighth, cooperative learning; ninth, theme exploration learning [5]. The research shows that for college graduates who are about to enter the workplace, the role of English is more prominent. CET-4 and CET-6 certificate is a necessary condition for college graduates to seek employment. Good English listening and speaking ability is a killer for college students to enter excellent enterprises. Some scholars have done a survey of some employers, the theme is "you need more skills", the results show that more than 90% of enterprises want candidates to have strong English skills, especially English listening and speaking ability. Some enterprises directly related to English hope that college students can directly engage in some English related jobs in the workplace without additional vocational training. In addition, economic globalization also needs more international talents. All in all, the international background and domestic trend put forward higher requirements for Chinese college students to further improve their English proficiency, especially English listening and speaking ability. At the same time, Chinese college students are facing the dual challenge of high demand for English ability the Ministry of Education and society[6]. Ma Guihua expounds the practice of autonomous learning based on the MOOC model of Longman interactive English platform, meets the students' individualized learning needs, enables students to participate in the implementation and management of learning activities, and can effectively stimulate students' enthusiasm for learning. Ma Guihua believes that in today's era, network courses accord with the characteristics of college students' online learning. At the same time, MOOC fragmentation design has the characteristics of high flexibility, high absorption rate and strong pertinence, which can better stimulate students' interest in learning. And then cultivate students' autonomous learning ability[7]. Although their research results are very rich, but there are still some shortcomings.

Education is the cause of future achievements, and the demand for talents in modern society is becoming more and more diversified. In the era of knowledge economy, individualized education is undoubtedly a more suitable way of education. Finally, the concept of "student-oriented" education and teaching can be carried out. Based on big data technology, this paper designs and develops students' favorite courses through the analysis and mining of educational data, develops individualized education in digital environment, improves students' thinking mode, innovation ability and autonomous learning ability, and makes students' growth develop in the direction of individualization and better. The development of individualized education is not only conducive to the development of
students' own potential, but also conducive to the cultivation of innovative talents.

2. Method

2.1 Reliability Measurement Method
Using Cronbach Alpha values to confirm the credibility of the questionnaire and results, Cronbach coefficients are statistical, It refers to the average semidimensional coefficient obtained by all possible items of the scale, Is a commonly used reliability measure, (1) is the accounting formula (K expressed as the number of samples, \( \sigma^2X \) represents the variance of the total sample, \( 1\sigma_{Y_i} \) Represents the variance of the observed sample. Cronbach's \( \alpha \) coefficient is between 0 and 1, If the X coefficient is less than 0.6, Generally, the reliability of internal consistency is poor; The reliability of the scale is better, between 0.7 and 0.8, different researchers, there is also some deviation in the dividing line of reliability system, Some scholars have pointed out that, During the basic exploration \( \alpha \) the coefficients need to be above 0.8 to be identified, In the process of inquiry, Cronbach \( \alpha \) factor must not be less than 0.7 to be identified, But in reality, The coefficient shall be not less than 0.6):

\[
\alpha = \frac{K}{K-1} \left(1 - \frac{\sum_{i=1}^{K} \sigma_{Y_i}}{\sigma^2X}\right)
\]  

(1)

2.2 Differential Coefficient Analysis
Through the amount of difference in the data sample, The difference reflects the trend of population separation, That is, the degree of differentiation. This coefficient reflects the different needs of students in foreign language teaching, Through the coefficient of difference, Weighted by standard deviation and average, That the average score will be used as a reference to the difference, (2) is the accounting formula for the coefficient of difference (CV is the coefficient of difference, S standard deviation, x average. Experience shows that, CV values generally range between 5% and 35%, If >35%, It may be questioned whether the average is meaningless; If <5%, The question is whether the value of accounting is wrong, In educational evaluation, Teachers and school administrators also need to analyze differences, In order to judge the learning differentiation of students in different subjects and the same subject. Empirical markers of differentiation: if CV<9%, This means that there is little differentiation; If CV>20%, indicating severe differentiation; If 9%<CV<20%, Evidence of differentiation)[8]:

\[
CV = \frac{S}{x} \times 100\%
\]  

(2)

2.3 Assessment Scale Method
During the survey, the five-segment evaluation is called the evaluation scale method. Through the meaning of graph structure, the five-segment evaluation data are analyzed by structural analysis method, and the structural equation is established. The relationship between potential variables such as learning personalization and learning satisfaction is described by structural equation. The mathematical representation of the measurement model is [9]:

\[
X = \lambda_X \xi + \delta
\]

(3)

\[
y = \lambda_y \eta + \varepsilon
\]

(4)

The \( X \) represents the vector composed of exogenous index, the \( y \) represents the vector composed of endogenous index, the \( S \) represents the vector composed of exogenous latent variable, the \( \cap \) represents
the vector composed of endogenous latent variable, the correlation between exogenous index and exogenous variable $∧∧$ and $∧xy$ represent the correlation between endogenous index and endogenous variable[10].

The data can be S-T analyzed: the following parameters are counted as N representing the number of behavioral samples; NT representing the share of T behavior; NS representing the share of S behavior; and the RT and CH values are calculated by analyzing the above data:

$$RT = NT / N$$

$$CH = (g −1) / N$$

3. Experiment

3.1 Source of Experimental Data

Due to limitations, The questionnaire did not cover all colleges and universities in the country, Combined with the regional characteristics of foreign language education in all colleges and universities and the characteristics of the units where the researchers are located, Of 14 representative institutions, Among them, 985 colleges and universities, 217 schools, 1 regular institution, Ordinary two colleges and universities 5. The subjects were first and second graders, Learning college English, Try to reflect the real situation of college English learning needs. The total number of questionnaires distributed was 3,000, We collected 2,600 questionnaires, After sorting out the statistics, With complete information, The principle of accuracy, 2531 valid questionnaires, 2531 valid questionnaires entered into Excel forms, SPSS22.0, used CronbachAlpha0.938, of reliability tests AKMO is 0.955, Bartlett qualified, 2531 questionnaires had reliable reliability and validity.

3.2 Experimental Design

The purpose of this study is to carry out a certain range of investigation and research on the basis of analyzing the characteristics of college English curriculum, taking the theory of multiple intelligences, the theory of learner demand, the theory of learning style as the core, the theory of constructivism and the guide of college English curriculum. By AHP designing a questionnaire, this paper investigates the students' opinions and expectations on the five aspects of current teaching, understands the present situation of college English teaching in China, and grasps the students' needs and expectations for college English teaching. In order to make college foreign language teaching meet the needs of students and the needs of society for talent training, it is very necessary to carry out personality teaching in college public English teaching, and individualized teaching is an urgent need to meet the needs of students' learning.

4. Result

4.1 Digital Teaching Resources

As a part of the teaching environment, digital teaching resources have become an important part and practice hot spot of the individualized teaching work of contemporary college English. The construction and management of digital teaching resources is also the focus of the joint construction and sharing system in colleges and universities. Teaching resources are not ordinary cultural media, reflecting education rather than pure technical characteristics. Therefore, digital teaching resources must play a role in the process of teaching and learning, so that teachers and students can find more sense of belonging. There are many different factors in teaching resources. On the basis of analyzing the requirements of using digital resources in colleges and universities, nine features of digital teaching resources are extracted, corresponding to four dimensions of availability, applicability, importance and generative, as shown in Table 1.
Table 1. Extraction of digital teaching resources

| Resource use phase                      | Resource characteristics                                                                 | Impact dimension |
|----------------------------------------|------------------------------------------------------------------------------------------|------------------|
| 1. Find resources                      | Resources are easily accessible                                                        | Serviceability   |
|                                        | Source security                                                                         |                  |
|                                        | Application of resources by statute                                                    |                  |
|                                        | Low expenditure on resource costs                                                      |                  |
| 2. Use of resources to obtain information | Resources are easy to retrieve, media performance is easy to understand and supports man-machine interaction |                  |
| 3. Apply resources to practice         | The resource situation has no good dependence, and the structure degree adapts to the daily use demand, which can promote the reconstruction |                  |
| 4. Reuse resources in new situations   |                                                                                         | Reuse            |
| 5. Development of new resource instances |                                                                                         |                  |
| 6. Putting new resources at the service of others |                                                                                         |                  |

4.2 Qualitative Analysis of Personal Factors of Students

According to the six dimensions, the proportion of each dimension option to the total number of people formed a histogram, distribution classification index analysis, the number of students surveyed,4 sub-items before the value is not high, did not reach the group goal, has been fluctuating around 50%. This reflects respondents' dissatisfaction with current English teaching, as shown in Figure 1.
4.3 There Are Many Problems in College English which Need Individualized Teaching

Through a survey of the current situation of college English teaching combined with questionnaires and teacher interviews, we find that there are many problems in teaching. According to the learning needs of questionnaire design, the data analysis of target needs and learning needs is seriously differentiated, which is explained as teaching problems are different goals and different methods. The existing college foreign language teaching can not fully meet the needs of learners, as shown in Figure 2.

![Figure 1. Statistical chart of questionnaire satisfaction options](image)

**Figure 1.** Statistical chart of questionnaire satisfaction options

According to the classification of six problems in the criterion layer in the hierarchical analysis method, the following problems exist in college foreign language teaching through data analysis.

- **Problems found in compulsory knowledge:** The necessity of college foreign language learning is relatively unified, but there are obvious differences in level between different subjects; there are different understandings of the instrumental nature of college foreign language learning, working tools, communication tools, examination tools, Competitive advantages and other different understanding.

- **Problems found in the lack of knowledge:** Opening public English courses at the university stage makes students' comprehensive literacy consciousness highly convergent, but the direction of literacy promotion lies in professional ability, humanistic quality, international communication, professional communication. Language ability and other different emphases show great differences.

- **Problems found in learning knowledge:** The commonness and exclusivity of data statistics in learning supervisor motivation exist simultaneously, but the results show that the degree of will is insufficient. This proves that the curriculum structure in teaching can not fully attract students and consider whether the teaching methods and means are reasonable.

- **Problems found in the conditions of learning environment:** In this group of questionnaire design, according to the conditions provided by the curriculum as a school to learners, it is emphasized that the basic cohesion of the curriculum shows obvious differences in the degree of professional cohesion. These data challenge public English teaching according to scoring principle.

- **Problems found in learners' knowledge, skills and strategies:** Learners' learning habits, learning methods, opportunities that schools can provide for learners and the use of strategies in teachers' teaching process will have a significant impact on learners. Different teaching models used by learners and teachers have a direct impact on learning effect.

- **Problems found in learner motivation:** The analysis of this set of data shows the discretization of students' learning goal motivation. The emergence of such data highlights the singularity of the current teaching evaluation.
means, the assessment of students' ability and academic assessment, personal goals and the direction of school development. The solution should be to combine the evaluation of learning knowledge level with teaching evaluation.

4.4 Differentiation Coefficient
Because the index distribution can not reflect that individual students have a clear understanding of college English teaching, it is only in the stages of learning knowledge, learning environment conditions, learners' knowledge, skills and abilities, learners' motivation and so on. The results are shown in Figure 3.

![Figure 3. Differentiation coefficient table](image)

5. Conclusion
Our college English should pay attention to cultivating students' comprehensive application ability, especially listening and speaking ability, making full use of modern information technology to reform teaching mode, trying to mix teaching mode and changing single teaching mode based on teacher teaching. Because English has language characteristics, the state and society pay more attention to college students' practical application ability, especially the ability to communicate and communicate in English. The research shows that for college graduates who are about to enter the workplace, the role of English is more prominent. CET-4 and CET-6 certificate is a necessary condition for college graduates to seek employment. Good English listening and speaking ability is the killer mace for college students to enter excellent enterprises. In addition, economic globalization also needs more international talents. In a word, the international background and domestic trend have put forward higher requirements for Chinese college students to further improve their English proficiency, especially English listening and speaking ability. At the same time, Chinese college students are facing the dual challenge of the Ministry of Education and the society for the high demand for English ability.

References
[1] Landa I, Bono T J, English T. Mood regulation and relationship quality predict change in...
homesickness during college[J]. British Journal of Psychology, 2020, 111(1):55-69.

[2] Zhiyong S, Sidhu G K, Muthukrishnan P. College English Language Teaching Reform and EFL Lecturers' Teaching Practice: A Case Study in China[J]. Universal Journal of Educational Research, 2020, 8(1):230-237.

[3] Xiangmin L. Characteristics and rules of college English education based on cognitive process simulation[J]. Cognitive Systems Research, 2019, 57(OCT.):11-19.

[4] Shi W. Citing the report. ESP-based College English Curriculum Design of University of Finance and Economics [J]. China Journal of Specific and Academic Use English Teaching, 2018, 6(1):115-115.

[5] Rusdiana A. Personalized System of Instruction (PSI) Models: Using Digital Teaching Materials on Learning[J]. Creativity and Innovation Management, 2020, 9(5):314-324.

[6] Wang G. On the Application of Cooperative Learning in College English Teaching[J]. International Education Studies, 2020, 13(6):62-62.

[7] Zhao Y, Le J, Zhu L F, et al. Study on the effect of hypertensive treatment based on drug factor analysis model under the background of big data[J]. Journal of Intelligent and Fuzzy Systems, 2019, 37(11):1-14.

[8] Li J. An effective system layout planning method for railway logistics centre in the background of big data[J]. International Journal of Reasoning-based Intelligent Systems, 2018, 10(1):11-19.

[9] Zhang Y, Zuo L. College English Teaching Status and Individualized Teaching Design in The Context of Mobile Learning[J]. International Journal of Emerging Technologies in Learning (iJET), 2019, 14(12):85-85.

[10] Dennis F, Julia C. Discovering disciplinary differences: blending data sources to explore the student online behaviors in a University English course[J]. Interlending & document supply, 2019, 47(2):106-114.