



Effect Evaluation of College English Blended Teaching Based on Factor Analysis and Association Rules

Rong-rong Ruan¹ and Meng Ye^{2(✉)}

¹ Fuyang Normal University, Fuyang 236037, China

² CSG Peak Shaving and Frequency Modulation Power Generation Co., Ltd.,
Guangzhou 511400, China
ym42856@163.com

Abstract. In order to effectively evaluate the effect of College English blended teaching and optimize the implementation effect of College English teaching. Based on factor analysis and association rules, this paper proposes a study on the effect evaluation of College English blended teaching. Starting from the practice of practical English blended teaching mode, according to the characteristics of practical English blended teaching mode, based on factor analysis and association rules, this paper evaluates the effect of College English blended teaching by combining practice with theory. Through investigation and analysis, it is proved that blended teaching mode can optimize college English classroom teaching and improve students' English practical ability. Further optimize the implementation effect of College English teaching.

Keywords: Factor analysis · Association rules · College English · Mixed teaching

1 Introduction

At the end of 1990s, foreign educational circles reflected on online learning and put forward the concept of blended learning, aiming at organically integrating traditional face-to-face teaching and online learning. Blended teaching is essentially a blended learning model, which is guided by cognitive learning, constructivism and other teaching theories, and uses a variety of teaching media, means and resources to closely combine classroom teaching with online teaching. In recent ten years, mixed teaching has attracted wide attention at home and abroad. Blended teaching is also a hot spot in foreign language education research. Many educators have integrated the concept of blended teaching into college English teaching practice, focusing on blended curriculum design and development, blended learning strategies, blended teaching practice mode and effectiveness research [2]. The research on the evaluation of mixed teaching effect mostly reconstructs the evaluation mechanism of teaching quality from the aspects of teachers, students and peers. The evaluation index system is constructed unilaterally from classroom or online teaching, which lacks the analysis of teaching practice, and only a few studies pay attention to the evaluation of mixed teaching of

individual courses, especially the evaluation of the effect of English audio-visual and speaking mixed teaching.

With the reform and innovation of the modern education system, practical English teaching mode is developing from single mode to mixed mode. Mixed teaching mainly focuses on students, guides students' independent and personalized development, and enables students to conduct independent practical learning in class and after class [3]. Practical English mainly cultivates students' ability of listening and speaking, and attaches great importance to the cultivation of students' knowledge and practical ability. After the implementation of the hybrid teaching model, practical English has been continuously innovating and developing. The research on the results of hybrid teaching is an important basis for promoting the development of teaching. After studying the practical implementation effect of mixed teaching, professional evaluation should also be conducted on the teaching results obtained to further promote the application of mixed teaching model [4]. The evaluation index system of blended teaching effect should fully reflect the advantages of online teaching and offline teaching. Evaluation of online teaching effect should include the number of students' visits, the number of discussion participants, the completion rate of task points, the situation of video viewing, and the average score of homework, etc. [5]. Offline teaching effect evaluation includes three indicators: academic performance comparison, student evaluation of teaching, and peer evaluation. It focuses on the evaluation of teachers' teaching attitude, teaching skills, teaching methods, classroom organization, depth and breadth of teaching content, and students' satisfaction with teachers. In order to effectively evaluate the effect of College English blended teaching and guide students' self-development and personalized development, this paper proposes a study on the evaluation of College English blended teaching effect based on factor analysis and association rules. This paper constructs the structure system of College English blended teaching, emphasizes the organic combination of online and offline and the main role of students, evaluates students from a dynamic perspective and way of thinking, and obtains comprehensive indicators (principal components) and original variables by using factor analysis statistical method.

2 Evaluation of Blended Teaching in College English

2.1 The Structure System of College English Blended Teaching

Hybrid teaching is a combination of online and face-to-face. Compared with simple face-to-face or online learning, it not only reflects the different learning methods, but also reflects the different ideas. Blended teaching reflects the spiral development of learning concept [6]. We should not unilaterally emphasize the application of online learning environment and ignore the traditional face-to-face teaching, nor emphasize student-centered and ignore the leading role of teachers, or emphasize one kind of learning theory and ignore the guiding role of other learning theories. For the investigation of classroom teaching has a relatively mature framework [7]. According to the teaching process of management by objectives, teaching is divided into three stages: teaching preparation, teaching implementation and teaching evaluation. Teaching

preparation refers to the formulation of teaching plan before classroom teaching. Teaching implementation is divided into three types: main teaching behavior, auxiliary teaching behavior and classroom management behaviorism. Teaching evaluation refers to the evaluation of students’ academic achievement and teachers’ classroom teaching after classroom teaching. Based on this, the paper standardizes the dimensions of College English teaching implementation behavior (Table 1):

Table 1. The dimensions of College English teaching implementation behavior

The dimension of teaching implementation behavior				
Teaching behavior				
Main teaching behaviors				
Presentation behavior	Dialogic behavior	Guiding behavior	Auxiliary teaching behavior	Classroom management behavior
Text presentation	Discuss	Cooperative learning guidance	The application of classroom reinforcement technology	The management of classroom problem behavior
Language presentation	Q & A	Guidance of autonomous learning	Stimulation and cultivation of learning motivation	Classroom problem behavior
Action presentation	–	–	The construction of good classroom atmosphere	–
Audio visual presentation	–	Inquiry learning guidance	The realization of teachers’ expectations effect	Prevention of classroom problem behavior

Under the mixed teaching environment, teachers’ teaching is not limited to the classroom. Some researchers have explored the framework of teaching process under the blended teaching mode. The process of blended teaching is divided into four links: course introduction, activity organization, learning support and teaching evaluation. Curriculum introduction refers to the exchange of curriculum requirements and arrangements between teachers and students, and the guidance of learning strategies. Activity organization refers to three forms of activities: class collective learning, group cooperative learning and individual learning. Learning support means that students get help to solve learning difficulties, which can come from teachers or classmates [9]. Teaching evaluation refers to checking and evaluating the expected teaching effect. The characteristics of blended teaching make its evaluation methods richer. Different learning forms have different learning processes and produce different learning results, so it is necessary to use a variety of evaluation methods. Based on this, the framework of mixed teaching process is further constructed (Fig. 1).

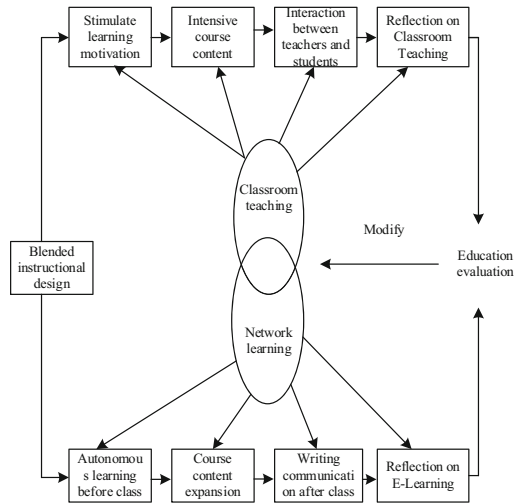


Fig. 1. Optimization of College English blended teaching process framework

Like traditional teaching, the framework divides the process of blended teaching into teaching preparation, teaching implementation and teaching evaluation. Teaching preparation in the mixed teaching environment, that is, teaching design, should consider both classroom face-to-face teaching and online learning. Teaching implementation is divided into face-to-face classroom teaching and online learning. In the classroom teaching part, teachers' main behaviors include stimulating students' learning motivation; Elaborate the course content and highlight the key and difficult points; Teachers and students interact and communicate to promote the construction of meaning; Teachers reflect on classroom teaching. In online learning, teachers' main behaviors include providing resources. Organize online interactive communication. Reflection on online learning. Teaching evaluation includes the evaluation of face-to-face classroom teaching and online learning. This framework follows the classic analytical framework of teaching preparation, implementation and evaluation, which fully reflects the characteristics of blended teaching, but the characteristics of personalized teaching emphasized by blended teaching are not clearly reflected in this framework [10]. The implementation is divided into the following four dimensions: building a mixed learning environment; Building mixed learning resources; Design and organize mixed learning activities; Implementing blended learning evaluation. This paper explores the structure of college English blended teaching. The following framework highlights the emphasis on the organic integration of online and offline and the main role of students. The framework is constructed from the perspective of students, but there is no clear explanation for teachers' behavior and role (Fig. 2).

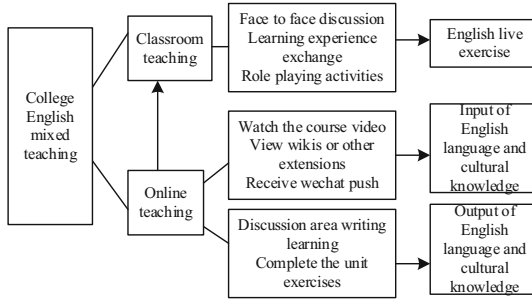


Fig. 2. Influencing factors of College English blended teaching

The reform of classroom teaching methods by teachers will be affected by internal factors, external factors and situation factors [11]. Internal factors refer to teachers’ own factors, such as growth experience, learning experience, teaching experience, etc. External factors refer to macro-social and cultural environment, such as economic development, foreign language education policies, etc. Situational factors mainly refer to the school environment in which teachers live, including school culture, teaching management, teaching resources, student sources, information technology, etc. Hybrid university English teaching factors affecting structure system not only be used to explain the factors affecting foreign language teachers classroom teaching method reform, can also be applied to analyze other situation of teacher's teaching behavior influence factor, the study found the teacher's choice of teaching strategies and use will be affected by factors of the students, curriculum factors and environmental factors, as well as the concept of teachers and the teacher individual characteristic factors. The student factor is also an important aspect that affects the teacher's teaching. If students have a good foundation and participate actively, teachers tend to implement student-centered teaching; On the contrary, if students are more passive and not actively participate in classroom activities, teachers will adopt teacher-centered teaching mode. In addition, good teacher-student relationship is also an important factor to promote teachers’ teaching. Let the linear regression model of random variable y and general variable x be as follows:

$$y = \beta_0 + \beta_1x_1 + \beta_2x_2 + \dots + \beta_px_p + \varepsilon \tag{1}$$

Based on this, the linear regression model can be expressed as:

$$\begin{cases} y_1 = \beta_0 + \beta_1x_{11} + \beta_2x_{12} + \dots + \beta_px_{1p} + \varepsilon_1 \\ y_2 = \beta_0 + \beta_1x_{21} + \beta_2x_{22} + \dots + \beta_px_{2p} + \varepsilon_2 \\ \dots \\ y_n = \beta_0 + \beta_1x_{n1} + \beta_2x_{n2} + \dots + \beta_px_{np} + \varepsilon_n \end{cases} \tag{2}$$

In matrix form:

$$Y = X\beta + y\varepsilon \tag{3}$$

To sum up, teachers’ teaching behavior is one of the decisive factors affecting teaching results, and the factors affecting teaching behavior can be summarized as follows: teachers’ own factors. Teachers’ teaching behavior is influenced by their own teaching ideas, teaching ability and teaching tact, which are influenced by teachers’ growth experience, educational background, learning experience and other factors. The nature of courses, class size, class hours arrangement, teaching objectives, teaching contents, teaching modes, class time and so on will have an impact on teaching behavior. Environmental factors can be divided into external environmental factors and internal environmental factors [12]. Teachers’ teaching is based on schools, so environmental factors outside schools are classified as external environment, such as social, political and economic conditions, educational policies, educational reform, teachers’ family factors and so on. All aspects of the school environment are classified as internal environment, including the school’s material conditions, policies, atmosphere and teaching management. These four factors do not work in isolation, but interact with each other, and have a comprehensive impact on teachers’ teaching. The following figure more intuitively shows the interaction between various factors and the influencing factors on English teaching evaluation (Fig. 3).

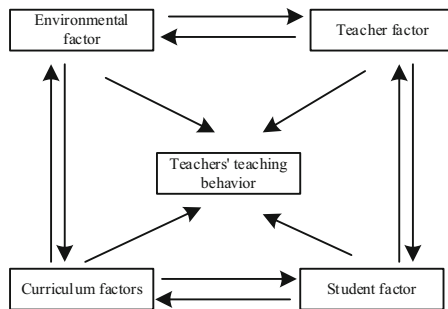


Fig. 3. Influencing factors of English teaching evaluation

To sum up, in terms of physical space, hybrid teaching includes online platform and offline classroom. On the online platform, students can learn autonomously and interact with teachers and students; In the face-to-face class, students show their achievements, teachers give feedback and organize discussions. Teaching evaluation runs through the two models.

2.2 Evaluation Index of Blended Teaching in College English

The evaluation of blended teaching should not only be based on one or two summative indicators, but also through a dynamic perspective and way of thinking to evaluate the students [13]. In the dynamic evaluation index, it can timely reflect the students’

learning status, such as specific to a week, a day. In this way, teachers can track and supervise the learning process of students according to the dynamic indicators, remind learners to pay attention to adjust the learning skills, and solve the problems encountered by students in time [14]. The comprehensiveness of the evaluation content requires that in the evaluation index, the investigation of knowledge points should be comprehensive, especially in the mid-term and final examination, and the distribution of knowledge should be comprehensive, not just around a certain part. At the same time, for the situation of students' participation in the discussion, we should not only examine whether the students participate in the discussion, but also examine what role they play in the discussion and their contribution to the team. The results of evaluation must be beneficial and set up to promote students' learning effect [15]. Evaluation is not only for students to summarize, but also for students to find their own shortcomings through evaluation, so as to improve the learning effect purposefully and directionally in the next study. Based on the above principles and the availability of data, the relevant indicators of the evaluation system and the corresponding evaluation methods, data types and evaluation subjects are as follows (Table 2):

Table 2. Evaluation system and index description table

Evaluation type	First level indicators	Secondary indicators	Evaluation method	Evaluation subject	Data type
Summative evaluation	Final exam	Final exam	Difference test	Teacher	Objective data
	Students' subjectivity	Satisfaction	Descriptive statistics	Student	Subjective factors
		Learning style	Descriptive statistics	Student	Subjective factors
Process evaluation	Pre class learning evaluation	Number of preview videos per person per month	Difference test	Student	Objective data
		Preview video viewing time per person per month	Difference test	Student	Objective data
	Evaluation of classroom activities	Number of discussions per person per month	Difference test	Student	Objective data
		Number of questions per person per month	Difference test	Student	Objective data
	After class learning evaluation	5 assignments and mid-term examination results	Difference test	Teacher	Objective data
The combination of process evaluation and summative evaluation	Construction of evaluation model	Combining process evaluation index with summative evaluation index	Correlation analysis	Combination of subjective data and objective data	
			Principal component analysis	Combination of subjective data and objective data	
			Regression analysis	Combination of subjective data and objective data	

The process is adopted in this paper can be seen from the table above six evaluation indexes, four summative evaluation index to evaluate, emphasizes the process assessment and summative assessment, evaluation indexes and involve wide, there are both subjective data and objective data, there are both students and teachers in the evaluation subject, evaluation system composed of these factors obviously satisfy the above principles, namely the evaluation criterion of differentiation, The diversification of the evaluation subject, the diversification of the evaluation method and the comprehensive evaluation subject. For dynamic evaluation of mixed teaching, the data collected in online learning can be used. However, considering the actual situation of operation in the random process in this paper, the course has fewer hours, so the dynamic data can be replaced by node data. The evaluation method in this paper also meets the dynamic evaluation process of the fifth point. It is assumed that the evaluation population is normally distributed.

If $(x_{11}, x_{21}), (x_{12}, x_{22}), \dots, (x_{1n}, x_{2n})$ is a pair of samples with a volume of n selected from two populations, where x_{11} is the first pair of values in the sample, one of the two population samples comes from population 1 and the other comes from population 2, the difference value of each pair of sample data is calculated, and results are obtained. The difference sample is expressed as follows:

$$\begin{aligned} x_{11} - x_{21} &= d_1, x_{12} - x_{22} \\ &= d_2, \dots, x \end{aligned} \tag{4}$$

Its mean and standard deviation are respectively:

$$\bar{d} = \frac{\sum_{j=1}^n d_j}{n(x_{11} - x_{21})} \tag{5}$$

$$s_d = \sqrt{\frac{\sum_{j=1}^n (d_j - \bar{d})^2}{n - 1}} \tag{6}$$

Similarly, the mean and standard deviation of the population are:

$$\mu_d = \frac{\sum_{j=1}^N d_j}{N} = \mu_1 - \mu_2 \tag{7}$$

$$\sigma_d = \sqrt{\frac{\sum_{j=1}^N (d_j - \mu_d)^2}{N}} \tag{8}$$

The process evaluation is mainly divided into three evaluation nodes, the evaluation of pre-class learning, the evaluation of classroom activities and the evaluation of after-class

learning [16]. Classroom learning evaluation includes the monthly viewing times of preview videos per person, the monthly viewing time of preview videos per person, and the answer scores of online preview. The evaluation of classroom activities mainly includes the number of discussions and questions each student takes every month [17]. The evaluation indexes of classroom activities are the scores of monthly exams and midterm exams, and the number of self-study sessions each student takes every month. The changes of these indicators in four months were analyzed and compared, and the number of videos per person watched per month was taken as the number of preview times of students in mixed class and the number of preview times of students in traditional mixed class to conduct a difference test. If the population of differences is normally distributed, then the sampling distribution is also normally distributed [18]. The mean and standard deviation of the sampling distribution of mean difference are:

$$\mu_{\bar{d}} = \sigma_d \mu_d = \sigma_d(\mu_1 - \mu_2) \tag{9}$$

$$\sigma_{\bar{d}} = \frac{\sigma_d}{\sqrt{n}} \tag{10}$$

Since the mean and standard deviation of the population are unknown, distribution or Z distribution can be used for analysis [19]. When two populations do not obey normal distribution, Wilcoxon (W) rank sum test is used. There are two independent samples X and y, the sample size is n1 and n2 respectively, and the rank sum is wx and wy respectively:

$$W_x + W_y = 1 = 2 + \dots + n - \mu_{\bar{d}} = \frac{n(n+1)}{2} - \mu_{\bar{d}} \tag{11}$$

If:

$$W_1 = W_x - \frac{n_1(n_1+1)}{2} \tag{12}$$

$$W_2 = W_y - \frac{n_2(n_2+1)}{2} \tag{13}$$

And using standard normal distribution Z to approximate test, we can get:

$$\begin{aligned} Z &= \frac{W_x - \mu \pm 0.5}{\sigma(W_x + W_y)(W_2 - W_1)} \\ &= \frac{W_x - \frac{n_1(n_1+n_2+1)}{2(W_x+W_y)(W_2-W_1)} \pm 0.5}{\sqrt{\frac{n_1n_2(n_1+n_2+1)}{12} - \frac{n_1n_2 \sum (\tau_j^3 - \tau)}{12(n_1+n_2)(n_1+n_2-1)}}} \end{aligned} \tag{14}$$

The mathematical model of factor analysis is as follows:

$$X = AF + \varepsilon \tag{15}$$

where X is the original variable and F is the common factor variable, ε is a special factor, which means the part of the original variable that cannot be explained by the common factor variable. It is equivalent to the residual part in multiple regression analysis. A is the factor load matrix, and a_{pm} is the correlation coefficient between the p th original variable and the m th common factor variable. The specific expression is as follows:

$$A = \begin{pmatrix} a_{11} & a_{12} & \cdots & a_{1m} \\ a_{21} & a_{22} & \cdots & a_{2m} \\ \vdots & & & \vdots \\ a_{p1} & a_{p2} & \cdots & a_{pm} \end{pmatrix} \tag{16}$$

Based on the above algorithm, the comprehensive indicators (principal components) obtained by using the statistical method of factor analysis have the following characteristics with the original variables: each principal component can represent a linear combination composed of the original indicators; secondly [20], there should be no correlation between principal components; then the number of principal components should obviously be less than the number of original variables; finally, the principal components should cover most of the information of the original variables [21]. Through principal component analysis, the evaluation index can be reduced in dimension, and the main index can be extracted. According to factor analysis, the influence coefficient of each principal component and final grade can be obtained. The principal component with the highest coefficient is the most important factor affecting the learning effect (Table 3).

Table 3. Detailed description table of evaluation index

Index	Index description
Participation in the discussion	The full score is 10
Online answer results	A total of 10 multiple-choice Questions, the difficulty of these multiple-choice questions is general, 1 point for each question, the full score is 10 points
Preview video viewing duration	Preview video viewing duration = online duration - Online answer duration
Preview times before class	Whether or not to log in to the online learning platform every week, and online for up to 10 min is recorded as a preview for the student in that week
Homework results	That is, the score of the paper surface, each assignment is similar to the form of the test paper, with a full score of 100
Number of classroom questions	Every time you ask a question in class, it will be 1 point, and no question will be 0 points
Mid term and final examination results	And paper results

Based on the above evaluation system, college English teachers can not only control their own teaching process, understand the effects of all aspects of teaching, and adjust teaching design in time, but also fully understand students' learning status, urge and motivate students' learning participation, and keep students' interest and enthusiasm in learning for a long time [22]. Today, with the rapid development of information technology, college English teachers should make full use of Internet information technology, design evaluation dimensions and methods that are suitable for all aspects of teaching activities, and make a comprehensive and objective evaluation of learners' learning performance at all stages, so as to ensure that college English blended teaching is more efficient and quality.

2.3 The Realization of College English Mixed Teaching Evaluation

Teaching evaluation is the process of studying the value of teachers' teaching and students' learning, which plays a positive role in improving the teaching effect. In order to effectively improve the teaching effect and promote the positive role of network classroom in higher education, a set of scientific assessment and evaluation system should be constructed in the mixed teaching mode. Based on the theoretical and practical investigation in the early stage, a process-based assessment and evaluation system is constructed [23]. The specific framework is shown in Fig. 4. The assessment methods in this assessment and evaluation system can be selected and adjusted according to different teaching contents.

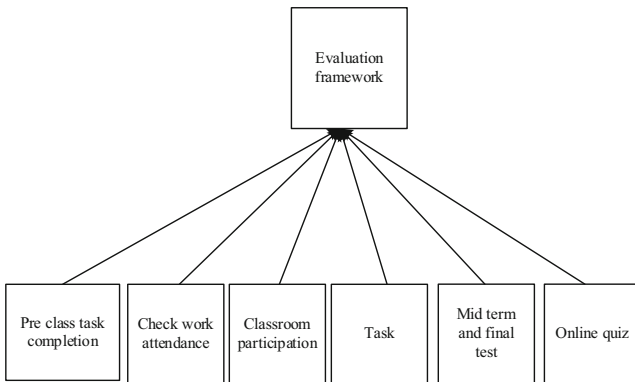


Fig. 4. A framework for grade evaluation of blended teaching model

Hybrid teaching can be divided into network course learning and face-to-face interpretation and practice of two phases, aims to guide students to acquire knowledge actively, and guide its applying theoretical knowledge to practice, therefore, the hybrid teaching evaluation content mainly examine the degree of knowledge acquisition, students ability of the application level and the degree of the practice of theoretical knowledge. Different from the traditional evaluation system, which focuses on the

basic theory and knowledge, the evaluation content of blended teaching is more comprehensive, including the evaluation of online course content, the specific performance of group cooperation, the attitude towards task activities and the comprehensive ability performance of offline practice activities. Among them, individual performance, such as class participation attitude, positive or not, and the completion of the comprehensive task in the network classroom, are the subjective motivation for the assessment of learning subjects. The completion of group discussion and collaboration, achievement report and display, and comments outside the group is used to examine students' practical application ability of knowledge, cooperation and communication ability, and language organization and expression ability. The blended teaching based on the network course will realize the transformation of the evaluation system from "theoretical cognition" to "ability application".

Teaching evaluation is the most important link in teaching design, which emphasizes taking teaching target as the main reference object. The goal of college English teaching in China is to combine basic grammar knowledge, listening, speaking, reading, writing and translation skills with language culture organically, to cultivate students' comprehensive ability to use language, and to cultivate students' independent learning ability, exploration ability, international vision and cultural accomplishment in practical teaching. The overall goal of teaching activities includes cognitive field, emotional field and psychological field. In order to achieve the final goal of each field, it is necessary to set a series of goals from low to high. This model is based on Bloom's theory of categorical teaching objectives, which divides blended teaching objectives into three aspects: cognitive objectives, skill objectives and affective objectives. These three objectives constitute the core literacy of college English learners and run through the whole semester. In blended teaching, when evaluating college English courses, these core qualities should be quantified one by one, and specific evaluation items and methods should be adopted to form a complete teaching design and reflect the diversity of the evaluation system. Based on this, the evaluation system of blended teaching should be optimized as follows (Table 4):

Table 4. The Evaluation System of College English Mixed Teaching

Core literacy	Evaluation project	Concrete content	Evaluation method
Skill goal (30 points)	Learning files (10 points)	Self learning records of MOOC resources and Learning Websites	Students' self-evaluation, mutual evaluation and teachers' evaluation
	Term project (10 points)	Individual or group to complete English short play performance, etc	Teacher evaluation
	Use of mobile tools (10 points)	Use wechat, microblog and other mobile tools to receive and share information	Students' self-evaluation, mutual evaluation and teachers' evaluation

(continued)

Table 4. (continued)

Core literacy	Evaluation project	Concrete content	Evaluation method
Cognitive goal (40 points)	Classroom test and final written examination (30 points)	Vocabulary and grammar, writing, listening, reading comprehension, translation	Teacher evaluation
	Textbook learning (10 points)	Preview before class	Teacher evaluation
Emotional goals	Cultural literacy and international vision (10 points)	Understand Chinese traditional culture and be able to communicate in English	Students' self-evaluation, mutual evaluation and teachers' evaluation
	Effective learning strategies and behaviors (10 points)	Perseverance, willingness, patience, concentration, etc	Students' self-evaluation, mutual evaluation and teachers' evaluation
	Cooperation and innovation ability (10 points)	Group cooperative learning ability, innovative thinking ability	Students' self-evaluation, mutual evaluation and teachers' evaluation

By combining the process evaluation data and the summative evaluation data, the correlation analysis is conducted based on the final exam results. If the indicators in the process evaluation or the summative evaluation are significantly correlated with the results, it can be shown that the selection of research indicators and the construction of research system in this paper are better.

3 Analysis of Experimental Results

In order to verify the evaluation effect of College English Hybrid Teaching Based on factor analysis and association rules, the paper makes an empirical analysis, and takes the super star network teaching platform and learning app as the supporting environment for hybrid teaching. The system is composed of chapters, materials, assignments, evaluation, testing, notification modules, and provides a space for network communication between teachers and students. Actively strengthen the interaction and learning guidance between teachers and students online. The teacher asks students to check the teaching contents of relevant chapters and complete the micro course task points in relevant chapters. Teachers will arrange network homework regularly, check online autonomous learning in time, and include the results into the semester results in a certain proportion. Among them, group A is the evaluation method of this paper, and group B is the traditional evaluation method.

Table 5. Online learning situation table

Group	Visits	Number of discussions	Number of people	Task point completion rate	Total video viewing time	Average video viewing duration	Homework average
A	4883	432	30	98%	2873.9 min	93.75 min	97.68
B	1648	139	29	58.62%	979.8 min	33.78 min	83.13

It can be seen from Table 5 that Group A is obviously superior to Group B in terms of the number of visits, the number of participants in discussions, the completion rate of task points, the video viewing situation, the average score of homework, etc., and the learning effect between Group A and Group B is significantly different. It can be seen that in the network environment, in the class with mixed reform, students are more motivated to learn independently after class, have better participation in discussion, have higher completion rate of task points and videos, and have better completion quality of homework. This is mainly due to the fact that under the guidance of teachers, group A students develop the habit of self-study on the Internet, can actively consult relevant materials, make full use of online listening training, strengthen language input, and enhance the interaction between teachers and students, while group B students have insufficient motivation for self-study on the Internet because their teachers have not made rigid requirements, and log in to the platform only to complete their homework, while watching micro-lesson videos and network interaction are not ideal. In the classroom practice, the pre-test and post-test were carried out for the students in group A and B, and the SPSS software was used for comparative analysis. In the classroom, we carefully observe students' reactions, interview students' feelings and record students' changes, aiming at verifying the theory with practice and drawing effective conclusions (Table 6):

Table 6. Pre-test English teaching scores

Achievement	Group	Number of people	Mean value	Standard deviation	Identification error of mean value
	A	30	66.79	13.35	2.32
	B	29	66.33	13.85	2.54

According to the table, the average scores of English listening, listening and speaking in both groups are 65.78 and 65.32, respectively, among which the scores of Group A are slightly better than those of Group B, and the average difference between the two groups is not significant, and the English listening level of both groups is basically at the same level.

Table 7. Post-test results

Achievement	Group	Number of people	Mean value	Standard deviation	Identification error of mean value
	A	30	86.05	5.92	1.06
	B	29	79.64	6.51	0.15

It can be seen from Table 7 that after the implementation of the mixed teaching mode, the average post-test scores of Group A and Group B are 86.01 and 79.74, respectively, and the scores of Group A are better than those of Group B, with obvious difference in average. Thus, after receiving mixed teaching, the results of Group A are higher than those of Group B, which also proves that mixed teaching plays a positive role in English audio-visual teaching and has a positive impact on students' listening and speaking ability. These data show that most students agree that mixed teaching can greatly promote their English learning; During the period of mixed teaching, when students use the network to study independently, teachers' guidance and help are very necessary, which also confirms the importance of adopting mixed teaching. The course group set up an open demonstration class of English audio-visual, speaking and held a teaching salon of mixed curriculum reform to share the experience of mixed reform with peers, which won unanimous praise. The course group held a teacher symposium, and invited teachers to evaluate the course from five aspects: teacher quality, teaching content, teaching condition, teaching method and teaching effect (Table 8).

Table 8. Peer evaluation form

Index	Teaching content (20)	Teaching conditions (20)	Quality of Teachers (20)	Teaching effect (20)	Teaching methods (20)	Total 100
Score	18	19	19	18	18	92

Teachers participating in the evaluation generally believe that the course teaching has distinctive features, can make full use of multimedia means, and has various content forms and flexible teaching methods. By adopting the flip classroom mode, students can watch micro-lessons in advance and complete the task points. Students can absorb knowledge according to their own characteristics and rhythm, and then return to class discussion after completing the comprehensive study of knowledge, which can significantly improve the quality of discussion and greatly improve the degree of interaction between teachers and students. Extracurricular online self-study enhances students' learning enthusiasm and initiative, effectively improves learners' listening and speaking ability and cultivates their English skills.

4 Conclusion

Hybrid teaching model applied to the English language teaching, pay more attention to training students' language application ability, cooperation, explore, autonomous learning and so on the many kinds of teaching methods, teachers as the guide and students as the main body, let English teaching activities to achieve learn and transformation of knowledge, make the teaching process to realize from the focus on the teaching goal to the student individuality development needs. Mixed teaching requires the participation and cooperation of teachers and students, which is based on practice teaching to jointly participate in the exploration and research of mixed teaching mode. At present, practical blended English teaching in colleges and universities is still in the stage of active exploration and needs to be persisted for a long time. In the future development, we should further optimize the process framework of College English blended teaching and add summative evaluation indicators to evaluate the effect of College English blended teaching.

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