English Hybrid Teaching Model Analysis Teaching Based on Association Algorithm

Jing Zhang*
Heilongjiang International University, Harbin 150025, China

*Corresponding author e-mail: zhangjing@hiu.edu.cn

Abstract. English autonomous learning ability can help middle school students to improve their self-inquiry ability, establish correct personality and strengthen their thinking, so that students can feel the joy of success after studying hard. The cultivation of college students' English autonomous learning ability is one of the goals of the new curriculum. To enhance college students' interest in English learning, to promote their active exploration of English knowledge, to attract their attention, to form active learning motivation, and to scientifically arrange their daily learning of English subjects. Gradually form English learning ability, promote their English achievement, this is our college English teachers to develop students' autonomous learning ability. Based on the practice method of English autonomous learning ability training in higher vocational colleges based on SPOC, this paper establishes the weight index distribution, and divides 60 testers into high and low groups according to 27% of the project scores.

Keywords: Autonomous Learning, Higher Vocational University, Spoc Reversal Class, Online Learning

1. Introduction
Under the increasingly important background of core literacy, students constantly update their learning methods, which is the trend of advocating self-study in the educational ecological environment. As a result, teachers pay a lot of effort, but the teaching effect is not good [1]. In such an educational model, teachers lack the cultivation of students' autonomous learning ability, and students are in a passive learning state. In the long run, students will be seriously lacking in creativity. In order to improve this situation step by step, only by changing the traditional mode, let the students as an active participant, to understand English, encourage themselves to learn English, the teacher is only an auxiliary role. Cultivate students' English self-study ability, teachers' teaching focus should be how to stimulate students' interest in autonomous learning and promote students to set up their own spiritual of study [2]. At the student level, students under the guidance of teachers, in the detailed operation of language learning, improve the sense of autonomy, further play the subjective initiative, to achieve the goal of autonomous learning.

The Ten-Year Development Plan for Educational Informatization (2011-2020) provides students with an intelligent learning environment, uses modern information and network technology to carry
out heuristic, exploratory and interactive teaching in colleges and universities, advocates formative evaluation, strives to establish a new student-centered teaching model, advocates the promotion of cooperation between schools through the network, and promotes the overall level of information-based teaching; vigorously advocates students to use network information technology to carry out autonomous and cooperative learning; and enables students to develop the habit of using network information technology to learn, cultivate personality and improve learning effectiveness. From 2013 to the end of 2018, the "Belt and Road" policy brought China $6 trillion in trade. China's policy of "opening to the outside world" has prompted more and more Chinese enterprises to go abroad, and has also forced them to put forward higher requirements for industrial upgrading and personnel quality, especially for the of complex talents who are proficient in both English and technology [3]. In the above situation, higher vocational English teaching is also facing higher challenges. In recent years, with the development of economic globalization, with the strong support of national policies, higher vocational education in China has developed rapidly, becoming the cradle of cultivating high-quality skilled talents in China's economic development, industrial upgrading and industry transformation. But at the same time, due to the influence of traditional ideas, the students of higher vocational education are not very good, as well as the imperfect structure of higher vocational education system, the lack of teachers and other reasons, higher vocational education is also faced with various problems, and these problems also exist in teaching of higher vocational public English [4].

Based on the background of the times and the actual situation, this paper aims at promoting the English learning of higher vocational students, explores the mixed learning theory on the basis of association algorithm, and designs the SPOC teaching at the same time, and applies this part to the concrete teaching practice. By analyzing the students' test scores and the data of the initial and final questionnaires, we can evaluate the learning effect, hoping to provide reference for the research of mixed learning theory and SPOC teaching practice.

2. Relevant Theoretical Foundations

2.1. Association Algorithms

Let us be the percentage of things in the D that contain both A and B in the database. Its support is:

\[ S(A \rightarrow B) = P(A \rightarrow B) = \frac{|AB|}{|A|} \]  

(1)

Let the C be the credibility of the rule A→B, indicating that the C contains both A and B itemsets, relative to the percentage of itemsets contained, as shown in formula 2:

\[ C(A \rightarrow B) = P(A|B) = \frac{|AB|}{|A|} \]  

(2)

Promotion:

\[ I(A \rightarrow B) = \frac{P(AB)}{P(A)P(B)} \]  

(3)

2.2. SPOC Construction

Constructivist learning theory holds that the way of acquiring knowledge lies not in the direct indoctrination of teachers, but in the of active construction through the study of a series of teaching resources and the exchange and cooperation between teachers and students [5].

First of all, in the teaching design which integrates the SPOC idea, the teacher selects the learning resources which are most consistent with the teaching goal before class, and considers the difference between the students' original knowledge level and the difficulty degree of the resources. Reasonable
and effective resources are more helpful for students to construct knowledge independently, which reflects the resource attributes in constructivist learning environment [6]. Questions and answers between teachers and students in the pre-class session, presentation and presentation of students in the middle-class session, summary and comments of teachers, reflection and communication between teachers and students in the post-class session can fully mobilize students' thinking and creativity, so that each individual student can integrate into the class group, actively interact and communicate in the learning process, and enhance the students' sense of social existence, which reflects the "conversational" attribute in the constructivist learning environment. Then, the students in the pre-class session ask questions and communicate on the QQ group platform, discuss the difficult problems encountered together, and the teachers should supplement and analyze them in due course; The report and exchange of student representatives in class show the style of each group, and the wonderful display cannot be separated from the clear division of labor and cooperation of the early group. Students inevitably encounter setbacks in the process of reflection and summary or work design after class, and communicate and interact on the QQ group platform to answer doubts, which reflects the of cooperation attributes in the constructivist learning environment [6].

To sum up, the teaching design based on SPOC model is closely centered on "learner-centered ", which is the most emphasized point of constructivism.

2.3. SPOC Teaching Model
Specific to the SPOC teaching mode, can be understood as "pre-class online learning under the middle line of learning after class online learning" three parts, applied to the teaching process is divided into pre-class, in-class, after-class three stages [7].

First of all, for the problem of insufficient English class hours in higher vocational colleges, the teaching activities are reasonably arranged and effectively decomposed SPOC the teaching mode. In the pre-class through self-study to the preliminary grasp of knowledge, in the class for troubleshooting, teacher-student interaction, after-class use of review to consolidate and strengthen, and teacher guidance, teaching evaluation throughout. Secondly, the traditional task-based teaching mode cannot realize teaching according to their aptitude and embody individualized teaching. SPOC teaching mode can provide high-quality teaching resources; each teaching link design highlights the main position of learners and realizes individualized customized learning. Finally, for the problem of weak self-control ability of higher vocational students, we should pay attention to the interaction between teachers and students SPOC the whole process under the teaching mode, guide students to complete their study, and teachers play the role of auxiliary teaching. As a mentor to accompany students to learn [8].

2.4. MOOC Problems
MOOC, as a new thing in the rapid development of network information technology, has many advantages that traditional face-to-face classroom does not have, such as open learning resources and anytime, anywhere learning and so on. But MOOC has also failed to overcome the major flaw in online courses, where online learning has long been seen as "tasteful learning ". MOOC has attracted the attention of the public, but as a learning model, its shortcomings are equally obvious. The main reason is that it is MOOC difficult for learners to reach a deeper level of learning. From the learner's point of view, this is learning [9].

First, as the learner begins to register for MOOC, Many people ignore a "threshold for learning ". Unlike traditional face-to-face classes, MOOC is free and open to the public, but there is still a "hidden threshold "-that is, the knowledge base and time and energy that learners have. This is particularly important for the next study. Different learning content and learning requirements all require learners to devote different energies. This all needs the learner to make the corresponding psychological preparation. MOOC registered learners are voluntary, psychologically. They all had a higher motivation at first. But in the next study, many learners have a psychological gap, find that there is a big gap between the selected learning content and their goals. Like, Duck University( Duke University) in the "astronomy "(Astronomy) course on the Coursera platform, of all the 60,000
registered learners, Only about 2,000 people graduated, Only 3% of the total. Statistics show, the problems most learners respond to are: it takes a lot of time and energy to study in reality; This learning content requires sufficient professional basic knowledge; The course teaching lacks interaction and so on. When learners find that there is a big gap between expectations and reality, their internal motivation for learning will also be significantly reduced. Therefore, the final learning results mentioned above will appear.

Secondly, compared MOOC traditional face-to-face teaching, the biggest deficiency is that teachers cannot control the whole teaching process. MOOC form requires learners to have very high self-discipline. Although online learning, students can arrange their own learning, but the quality of learning is very unsatisfactory. MOOC teaching mainly to teach, in a one-way, knowledge indoctrination way. Even if its content is attractive, monotonous teaching can easily make learners lose interest in learning. A post-duke study cited the main reasons why ten learners failed to complete their MOOC, including "listening to classes is easy to feel tired, monotonous, lack of necessary curriculum guidance ", "interaction interface is difficult to operate, compared with face-to-face teaching, the degree of interaction is quite different ", all of which seriously affect learners' motivation.

Finally, there are many problems in MOOC learning evaluation. Among many MOOC learning, its evaluation content is incomplete and scientific. From the point of view of online homework and network testing, MOOC lacks the necessary anti-cheating mechanism. If it is easy to copy or copy to assignments and tests, there is no doubt that it will cause irreparable damage to independent learners [10].

3. English Hybrid Teaching Design Based on Association Algorithm

3.1. Teaching Content
First of all, the emphasis of higher vocational education lies in the cultivation of professional ability. Therefore, for higher vocational English education, professional English or professional English is also the core content, which is also the most common place for higher vocational students to use English in their future jobs. However, under the condition that the teaching time of higher vocational English is very limited, how to teach professional English on the premise of completing the prescribed requirements has also become one of the difficult problems to be solved.

Secondly, the outstanding professional English teaching in higher vocational English is not to ignore the study of basic English. On the contrary, a solid foundation of English is the prerequisite for learning professional English well. So how to balance the two? The author believes that higher vocational English teaching should highlight the key points of the stage. In the first stage of higher vocational students' admission, general English teaching should be carried out to lay a solid foundation; in the second stage, professional English teaching should be carried out according to the characteristics of the major, focusing on the cultivation of professional vocabulary learning and listening and speaking ability in professional scenes, that is, to cultivate students' ability to use English in practice.

Therefore, the reason why the teaching practice of this higher vocational English SPOC model adopts the way of public elective course is based on the above situation, after fully listening to the opinions of teachers and students by questionnaire arrange the teaching content on the premise of students' needs and professional requirements.

3.2. Presentation of SPOC Mode Teaching Content
The presentation of SPOC mode teaching content mainly reflects the construction of online SPOC platform curriculum resources, which is also the stage of online learning to realize knowledge internalization. At present, the most common application in SPOC platform is all kinds of micro-lessons. In the past, boring text or long video cannot stimulate students' interest in learning, but can easily reduce the learning effect, resulting in teaching activities cannot continue. For example, the Net Ease open class and the wonderful video of the fruit shell college in our country have great
attraction to the students, which is a method that every teacher who implements the SPOC teaching mode is worth learning from.

SPOC online video on the platform, there are two main sources, namely," introduction "and" self-construction ". The "introduction" method refers to the selection from the MOOC platform or other high-quality online courses open to the public according to the teaching requirements of the course and the SPOC teaching mode. The selection criteria are generally based on the needs of the teaching staff, teaching methods and teaching activities, and can be adapted to meet the needs of students if necessary.

4. Analysis of English Hybrid Teaching Based on Association Algorithm

4.1. Pre-trial Investigation

As shown in figure 1, it can be seen that most students are very expected and recognized for online learning, which fully meets the conditions for carrying out experiments. In order to control the variables, the two classes in this experiment were taught by the same teacher and the same teaching materials were selected.

4.2. Academic Achievement Statistics

As shown in Table 1, in this pre-test,60 testers were divided into high and low groups according to 27% of the item scores, and the high and low groups had significant differences in all 39 items, indicating that the questionnaire was well differentiated. Cronbach’s Alpha coefficient is between
0.893, 0.813 and 0.846 in three dimensions, which indicate that the overall reliability of this questionnaire is high and the internal consistency of each factor is high.

**Table 1.** Overall reliability analysis of learning attitude questionnaire

| Dimension                  | Classification                                | Number of entry | Cronbach’s Alpha |
|----------------------------|-----------------------------------------------|-----------------|------------------|
| Cognitive Dimensions       | Evaluation of English Teachers                | 6               | 0.893            |
|                            | Evaluation of English Teaching Materials      | 3               |                  |
|                            | Evaluation of the learning environment and resources | 5               |                  |
| Emotional dimension        | Learning Interest and Confidence              | 6               | 0.813            |
|                            | Feelings of people/culture in English-speaking countries | 4               |                  |
| Behavioral Intention Dimension | Learning Initiative                           | 6               |                  |
|                            | Focus on the Value of English Learning        | 3               | 0.846            |
|                            | Willingness to overcome difficulties in learning | 3               |                  |
|                            | The desire to interact with teachers          | 3               |                  |

4.4. Analysis of the Difference between Pre- and Post-test Students’ learning Attitudes in Experimental and Control Classes

**Table 2.** Analysis-test differences between experimental and control classes

| Before measurement | Experimental class | Control classes | Sig   |
|--------------------|--------------------|-----------------|-------|
|                    | N(number of samples) | M(average)       | N(number of samples) | M(average) |       |
| Ensemble           | 30                 | 4.3             | 30    | 4.4            | 0.106  |
| Cognitive Dimensions | 30                 | 4.3             | 30    | 4.3            | 0.083  |
| Emotional dimension | 30                 | 4.6             | 30    | 4.7            | 0.162  |
| Behavioral Intention Dimension | 30                 | 4.1             | 30    | 4.1            | 0.759  |

There was no significant difference in English learning attitude between the two classes (Sig=0.106>0.05). There were no significant differences between the two classes in cognitive dimension (Sig=0.083>0.05), emotional dimension (Sig=0.162) and behavioral intention dimension (Sig=0.759>0.05), indicating that the initial English learning attitude of the experimental class and the control class was the same as that of the control class.

At the end of the semester, the students of the two classes were tested in the same way. A total of 60 valid questionnaires were collected. Through the statistical analysis of the questionnaire, we can find that the students in the experimental class have greatly changed their English learning attitude compared with the students in the control class. The difference was significantly higher in cognitive dimension than in control class (M=5.1>4.4)(SigM=0.043 to 0.05); in emotional dimension, although the experimental class was higher than in control class (M=4.9>4.7), there was no significant difference between the two classes (0.095 to 0.05); in behavioral intention dimension, the experimental class was higher than in control class (M=4.7>4. The difference between the two classes
was also extremely significant (SigM=0.027<0.05).

**Table 3. Post-test differences between experimental and control classes**

| After measurement          | Experimental class | Control classes | Sig  |
|----------------------------|--------------------|-----------------|------|
|                            | N( number of samples) | M( average) | N( number of samples) | M( average) |      |
| Cognitive Dimensions       | 30                | 5.1            | 30              | 4.4          | 0.043|
| Emotional dimension        | 30                | 4.9            | 30              | 4.7          | 0.095|
| Behavioral Intention       | 30                | 4.7            | 30              | 4.3          | 0.027|

5. Conclusions

Based on the SPOC teaching mode, the teaching reform of higher vocational English course is carried out, the resources of online education platform are integrated, the online learning index is quantified, and the online learning result evaluation method is achieved. In order to guide and guide students to effectively carry out online independent inquiry learning. And in the whole process, according to the quantitative score of each link in the production line, the final evaluation model different from the traditional model is established. To achieve a comprehensive, objective and procedural final assessment of students. Compared with the traditional evaluation method, the questionnaire has achieved good results.

References

[1] Ige O A, Hlalele D J. Effects of computer-aided and blended teaching strategies on students' achievement in civic education concepts in mountain learning ecologies. Education and Information Technologies, 2017, 22(6):1-17.
[2] Kaplan A M, Haenlein M. Higher education and the digital revolution: About MOOCs, SPOCs, social media, and the Cookie Monster. Business Horizons, 2016, 59(4):441-450.
[3] Zhang E, Zhang W, Jin C. SPOC-based Flipped Classroom of College English: Construction of an Effective Learning Model. Technology Enhanced Foreign Language Education, 2018, 13(1):37-38.
[4] Yu H. Promoting strategy research on blended teaching mode reform in colleges and universities: a case study in China. International Journal of Social Media and Interactive Learning Environments, 2017, 5(1):79-80.
[5] Caravias V. Literature Review in Conceptions and Approaches to Teaching using Blended Learning. International Journal of Innovation in the Digital Economy, 2015, 6(3):46-73.
[6] Caravias V. Literature Review in Conceptions and Approaches to Teaching using Blended Learning. International Journal of Innovation in the Digital Economy, 2015, 6(3):46-73.
[7] Mchunu S P, Imenda S N. The Effects of Traditional, Outcomes Based Education (OBE) and Blended Teaching Approaches in Alleviating Conceptual Difficulties and Alternative Conceptions in Grade Twelve Mechanics. International Journal of Educational Sciences, 2015, 8(2):333-343.
[8] Kaplan A M, Haenlein M. Higher education and the digital revolution: About MOOCs, SPOCs, social media, and the Cookie Monster. Business Horizons, 2016, 59(4):441-450.
[9] Zhang Y, Rataj K, Simpson G G, et al. Crystal Structure of the SPOC Domain of the Arabidopsis Flowering Regulator FPA. PLoS ONE, 2016, 11(8), 1321-1354.
[10] Wang Y. A Study on College English High-efficiency Class Based on Blended Teaching Mode of Flipped Classroom. Theory and Practice in Language Studies, 2020, 10(9):1066-1067.