

## Retraction

# Retracted: Assessing the Impact of the MOOC Learning Platform on the Comprehensive Development of English Teachers at College Level under “Double First-Rate” by Utilization of the SWOT Analysis in Hunan Province, China

### Journal of Advanced Transportation

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

- (1) Discrepancies in scope
- (2) Discrepancies in the description of the research reported
- (3) Discrepancies between the availability of data and the research described
- (4) Inappropriate citations
- (5) Incoherent, meaningless and/or irrelevant content included in the article
- (6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article’s content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

### References

- [1] W. He, “Assessing the Impact of the MOOC Learning Platform on the Comprehensive Development of English Teachers at College Level under “Double First-Rate” by Utilization of the SWOT Analysis in Hunan Province, China,” *Journal of Advanced Transportation*, vol. 2022, Article ID 9202921, 8 pages, 2022.

## Research Article

# Assessing the Impact of the MOOC Learning Platform on the Comprehensive Development of English Teachers at College Level under “Double First-Rate” by Utilization of the SWOT Analysis in Hunan Province, China

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This research is to investigate the impact of massive open online course (MOOC) learning platforms on teacher development, promote the development and innovation of online learning models under the “Double First-Rate,” and especially expand the application of the MOOC platforms combining language learning with professional development paths. The MOOC online learning platform has a problem of a high abandonment rate. This paper first proposes a MOOC learning recommendation algorithm based on the learning sequence and similarity distance analysis as well as evaluates its accuracy. Then, the reliability test and the MOOC learning recommendation algorithm are used to evaluate the quality evaluation system of English teaching in the MOOC utilizing the structural equation model. Finally, the strengths, weaknesses, opportunities, and threats (SWOT) are determined to analyze the impact of the MOOC regarding the English teaching platform on teachers’ comprehensive development. The results show that the MOOC platform-based learning recommendation algorithm has higher recommendation accuracy and efficiency, improving the learning effect with the utilization of the MOOC. Also, it can effectively reduce the abandonment rate and has a positive effect of resolving the interaction problem pertinent to characteristic differences and sequences in the learning recommendation. The quality evaluation system of online English teaching in the MOOC has higher reliability and convergent validity, which shows better stability and consistency in all dimensions. If teachers can actively learn from the resources of the MOOC platform, then they continuously update teaching concepts, improve online teaching, give full play to their language advantages, accurately locate student needs, and develop unique courses. Therefore, it will promote the overall development of their careers and improve innovation.

## 1. Introduction

Massive open online courses (MOOCs) were originally proposed based on innovative teaching practices of online courses in Canada. A similar system is called “muke” in China that has open-access online courses and large-scale participation. The so-called “massive” means that there are many learners who have registered and participated in the teaching and learning activities. The online learning platform is not limited by space, and information resources can be shared in the Internet environment. The MOOC combines information with network technology to provide

high-quality and free learning resources while providing a complete learning experience in the framework of higher education that is developed based on traditional classroom settings [1,2]. From the perspective of the development of the education field, the MOOC is a breakthrough. Not only is it large-scale and openly online but also it can realize active learning, self-paced learning, timely feedback assignments, and cooperative learning with peers, thus enabling students to adjust their progress in learning efforts according to their actual learning abilities. Moreover, it is greatly significant for students who learn foreign languages, for example, English language through the MOOC platform. Based on the huge

data processing ability as a computerized process, the MOOC platform can evaluate and feed back the student's learning effort in real time. A variety of virtual networks have formed between students and curriculum knowledge, between students and teachers, and between students and many other learning partners. Thus, they can learn from each other and share. Relevance theory and the theory of free economics are the theoretical basis of the MOOC platform [2,3]. In recent years, the MOOC platform has developed rapidly, but the problems of the uneven quality of course resources and the redundancy of resources have led to high dropout rates and low completion rates. To solve these problems to meet the needs of users, a recommendation system is needed to accurately find course resources on the MOOC platform with a large amount of information. The recommendation system in the current situation mainly includes a user modeling module, a recommendation algorithm module, and a resource object modeling module. The recommendation algorithm is the main position, which is greatly significant in the construction of personalized education in the MOOC platform as well as the solution to the problem of high dropout rates and low completion rates among them [4].

In English language teaching at a college level, teaching management has a direct impact on efficient teaching order and quality. It constitutes the basis for the normal operation of teaching, especially it is the most critical factor in the context of both construction and development of "Double First-Rate" colleges and "Double First-Rate" majors [5,6]. With the gradual improvement of the management system and the accumulation of management practices, the composition of college teaching management has become increasingly rich including the management of several aspects such as teaching plans, teaching processes, teaching archives, teaching quality, and management of teachers and students. The people-oriented concept runs through the teaching management of colleges and supports the cultivation of students' innovative consciousness and scientific research literacy as well as the realization of teachers' career development and self-worth. The role of the college teaching management system in improving teaching quality and achieving teaching goals cannot be replaced by any other link [7,8]. Furthermore, the theory of objective management shows that when using an incentive method to define goals, many aspects such as time, society, and needs must be taken into account. The mutual integration between personal development and collective development, in turn, is achieved under the integrated management of each link, thereby promoting the realization of teaching goals and the comprehensive development of people. In college teaching management, the quality of college teaching plays an important role in achieving high-quality school development, enhancing core competitiveness, and promoting the development and progress of teacher teams. American experts put forward a process called the plan-do-check-act (PDCA) cycle concerning teaching quality management theory, and thus management activities can be advanced steadily according to these four cycles based on the premise of a process [9,10]. The recent

studies related to online teaching and learning of the English language are found in [11–13].

This paper takes the impact of the MOOC's online learning platform on the development of college teachers as the starting point and employs the MOOC English teaching in a college in Hunan Province as the research object as a problem. This paper proposes the MOOC learning recommendation algorithm based on learning sequence and similarity distance analysis since the MOOC platform has a high abandonment rate and a low completion rate. When it is combined with the reliability assessment method, the quality evaluation system of online English teaching in the MOOC platform is tested. Based on the strengths, weaknesses, opportunities, and threats (SWOT) analysis, the impact of the MOOC platform on the comprehensive development of English teachers is analyzed.

As a result, the MOOC-based online innovative education and learning platform will provide a certain reference for the improvement of teachers' professional knowledge and the comprehensive development of career paths. The results show that the MOOC learning recommendation algorithm has higher accuracy and efficiency. The recommendation of the prerequisite and subsequent learning content is more detailed. When combined with the correction of learning performance concerning the decay of time forgetting, the accuracy of the MOOC learning recommendations is significantly improved.

Since China has been under a comprehensive process of transformation in higher education for three decades, one of the implemented actions is called "Double First-Rate." Thus, one of the implementations that China plans to conduct to move towards a new era of higher education is based on implementing the concept of "Double First-Rate." By doing so, we investigate this approach concerning the MOOC platform.

The rest of the paper is organized as follows. Section 2 presents the methods covering the algorithm for the recommendation of the MOOC platform, its test indicators, and SWOT analysis. The results and discussion are introduced in Section 3. Section 4 concludes the research.

## 2. Methods

*2.1. The Improved Algorithm for the Recommendation of the MOOC Learning.* The issue of abandoning classes on the MOOC platform is serious, and the abandonment rate is as high as 90%. If the performance is unsatisfactory, then the relevant learning content is assessed as an insufficient prerequisite concerning the characteristics of academic performance when the diagnosis of the learning status related to the prerequisite of the target learner's behavior sequence is a concern. Correspondingly, if the performance is qualified, the relevant learning content can be used as the follow-up existing prerequisite, which is defined by the prerequisite reserve. For similar learners with a qualified performance, they are defined by the qualified neighbors. According to the time-series data corresponding to the learning behavior, the recommendation for prerequisite or subsequent assessments related to learning content can be

completed. In the study of the relationship between knowledge forgetting and time, a functional relationship between knowledge and time was proposed by a psychologist named Hermann Ebbinghaus. After the learning behavior is over, the rate of forgetting knowledge presents an exponential decrease from fast to slow. The functional relationship of knowledge decaying with time is constructed for the correction of academic performance in this paper, which is shown in (1). After considering the impact of time distance on performance, the prerequisite correlation coefficient is introduced, which is presented in (2). The collaborative filtering method supports cooperative learning modes and is based on similar learners to complete recommendations for

the related content. According to the time-series data of the learning behavior of the qualified neighbor, the collaborative filtering method is introduced by using prerequisite and subsequent recommendations to achieve the determination for different types of preselected recommendation content of the prerequisite or subsequence assessment.

$$f(e_{si}, dt) = e_{si} \times \left( (0.34 \times dt^{-0.2} + 0.13) \right), \quad (1)$$

where  $f(e_{si}, dt)$  represents the retained value of actual knowledge after time has passed, and the occurrence forgetting is realized for academic performance,  $e_{si}$  represents the academic performance, and  $dt$  represents the forgetting time.

$$q(i, d_1) = \frac{1}{1 + e^{\sum_{a=0}^{n_a} ((f(e_{ai}, dt(a_i, ad_1)) - \bar{e}_i) \times (\bar{e}_{d_1} - e_{ad_1}))} / \left[ \sum_{a=0}^{n_a} (f(e_{ai}, dt(a_i, ad_1)) - \bar{e}_i)^2 \sum_{a=0}^{n_a} (e_{ad_1} - \bar{e}_{d_1})^2 \right]^{1/2}}, \quad (2)$$

where  $dt(a_i, ad_1)$  represents the time interval between two learning behaviors,  $a$  represents the learning actor, and  $d$  represents the corresponding point of the insufficient prerequisite or prerequisite reserve.

**2.2. The Test Indicators of the MOOC in the Teaching Evaluation System.** The structural equation model, which is a statistical method to analyze the relationship between variables, combines the conventional factor analysis method with the path analysis method. Its development is based on the covariance matrix [14]. Reliability is a characterization of the stability and consistency of the measurement results of the scale tool. Thus, it is necessary to achieve it after repeated tests to confirm the reliability of the model. The greater the reliability is, the smaller the standard error would be [15]. This paper uses reliability as a test method to examine the quality evaluation system of online English teaching in the MOOC platform used by a college in Hunan employing the structural equation model. By testing the different dimensions of the reliability index, the stability of the evaluation system model of English teaching in the MOOC online and the consistency are more effectively and conveniently investigated between the dimensions. Specifically, this paper selects Cronbach's alpha coefficient, mean inter-item correlation coefficient (MIIC), composite reliability (CR), and average variance extracted (AVE) to evaluate the stability and reliability of the online teaching evaluation system test. The calculations of the  $\alpha$  coefficient, CR, and AVE are shown in equations (3)–(5), respectively.

$$\alpha = \frac{nr}{[(n-1).r + 1]}, \quad (3)$$

where  $n$  represents the number of dimensions in the system and  $nr$  represents the mean correlation coefficient between dimensions.

$$CR = \frac{(\sum \lambda)^2}{((\sum \lambda)^2 + \sum \delta)}, \quad (4)$$

where  $\lambda$  represents the factor load and  $\delta$  denotes the residual.

$$AVE = \frac{\sum \lambda^2}{n}, \quad (5)$$

where  $n$  represents the number of measurement indicators corresponding to the factor load.

**2.3. SWOT Analysis.** The SWOT analysis is a method used as one of the key indicators for decision makers to evaluate the environment of an enterprise [16]. Specifically, it includes four major aspects of the enterprise's competitive strengths, weaknesses, opportunities, and threats [17]. The SWOT analysis method is also used as an auxiliary analysis to complete. The purpose is to match the strengths and weaknesses of the enterprise with the external environment and find a balance point or development opportunity. Therefore, the enterprise's strengths and weaknesses are taken as internal conditions, while the opportunities and threats it faces are taken as external conditions. The comprehensive analysis is conducted by combining the two aspects. Similarly, this analysis method can also be applied to the impact of the MOOC learning mode on the overall development of English teachers. This paper introduces the SWOT analysis method, using the MOOC as external conditions and taking different colleges in the MOOC environment as the competitors. Afterward, it analyzes the opportunities and challenges that English teachers may face within a specific range in the MOOC environment. It is expected that effective evasion methods can be found to realize the possibility of turning weaknesses into strengths and give full play to the strengths, thereby promoting the comprehensive development of English teachers for the challenges and threats faced by competitors or the changing MOOC environment. The architecture of the corresponding SWOT analysis is constructed as depicted in Figure 1.

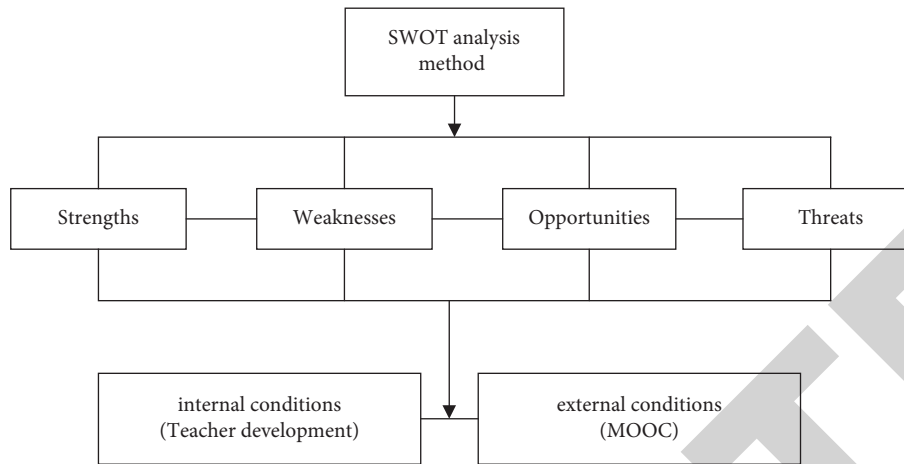


FIGURE 1: SWOT analysis using the MOOC as external conditions.

### 3. Results and Discussion

*3.1. The Recommendation of the MOOC Learning Based on Time Series.* In the context of the development of both computer information and Internet technology, the MOOC platform has brought much convenience to college teachers and students. However, the problems of a high abandonment rate and low completion rate cannot be ignored. Keep in mind that knowledge decays as time passes. The sequence of the learning behaviors of the qualified neighbors is constructed by learning the successful experience of the qualified users so the positioning of the target learner's behavior sequence is first completed. Besides, insufficient prerequisites and prerequisite reserves are determined. From the perspective of the time series, a diagnosis method of positioning status is proposed. Through the prerequisite and subsequent recommendations for the diagnosis results in time series, it is expected that the MOOC has a more detailed recommendation for learning content. According to the time-forgetting theory proposed by Ebbinghaus, the correction of the academic performance is completed. Then, the collaborative filtering method is improved to meet the requirements of the new type of adaptive learning and to support both mutual assistance and cooperative learning. Based on various combinations of the number of nearest neighbors denoted by  $\mu$  and the number of recommended results denoted by  $\theta$ , the distribution changes of the accuracy and recall ratio under different recommendation methods are shown in Figures 2(a) and 2(b), respectively.

It is found that the consistency of the recommended accuracy is higher under the combination of  $\mu$  and  $\theta$  parameters with different values when the data changes are examined in Figure 2. The accuracy of prerequisite recommendation (PR) and subsequent recommendation (SR) is higher than that of collaborative filtering (CF) recommendation. The parameters  $\mu$  and  $\theta$  have an impact on the accuracy of the recommendation, and the value of  $\theta$  has a higher degree of impact on the recommendation result.

The MOOC learning recommendation method based on the time series established in this paper has higher accuracy. On the MOOC platform, more detailed recommendations for prerequisite and subsequent learning content are implemented, thereby resolving the shortcomings of the current platform recommendation objects that are mainly focused on unlearned content. The purpose of improving the accuracy of the recommendation is achieved by correcting the learning performance that has been decayed by time forgetting and applying it to the recommendation of learning content based on time series. Under the diagnosis and positioning of the learning behavior sequence, the time series-based recommendation is completed according to the positioning results, thereby supporting the adaptive learning model. The improved collaborative filtering method through the prerequisite and subsequent recommendations can complete the screening of the qualified neighboring learners. The accuracy of recommendations is improved while reducing negative samples. The improved collaborative filtering method can select the prerequisite and subsequently recommended learning contents, and it can further cover the review recommendations of the learned contents. Also, the order relationship will be considered in the process. In contrast, the general collaborative filtering method's selection range for preselected objects is a collection of neighboring learning content, and it mainly recommends unlearned content. In addition, the improved collaborative filtering method also considers the characteristics of academic performance and time forgetting. Thus, the accuracy of the recommendation is improved. The proposed MOOC platform recommendation method is based on the analysis of the learning sequence and multiple similarity distances. It has a positive effect on resolving and overcoming problems such as differences in characteristics and the mutual impacts of sequences on common product recommendations. Based on the increases in the accuracy and efficiency of the MOOC platform, the improvement of the MOOC recommendation in this paper also improves the effectiveness of using the MOOC for learning activities. Hence, it supports the MOOC learning mode, and it can resolve the problems encountered

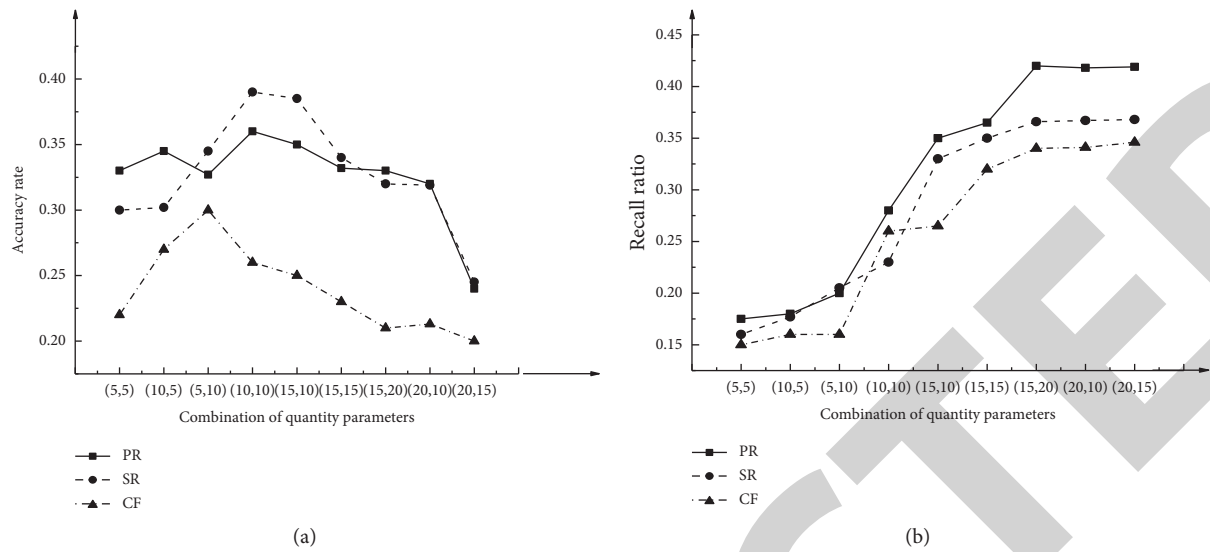


FIGURE 2: Distribution changes under several MOOC learning recommendation methods: (a) accuracy; (b) recall ratio.

in the process. Moreover, it can reduce class abandonment to improve academic performance, thereby helping the further development and improvement of MOOC education.

**3.2. Test of the Teaching Evaluation System Based on the MOOC Learning Recommendation.** In the current environment of building “Double First-Rate” colleges and majors as well as developing the MOOC online education, the quality of English teaching at college levels plays an important role. It is also necessary to test the stability and consistency of each dimension of the online teaching quality evaluation system concurrently. From the perspective of English teachers, this paper applies the MOOC learning recommendation algorithm to test the quality evaluation system of online English teaching. The reliability and quality evaluation of English teaching at the college level utilizing the MOOC online is conducted based on the structural equation model. The distribution and changes of the corresponding evaluation indicators in each dimension are shown in Figure 3.

It is found that the corresponding value of Cronbach’s alpha coefficient is 0.98 on average, and the corresponding value of CR is also above 0.90 in the test of the reliability of the quality evaluation system of English teaching in the MOOC platform by utilizing the analysis of several different evaluation indicators presented in Figure 3. The corresponding value of AVE is above 0.50, and the MIIC range is between 0.473 and 0.702 for the whole set of the dimensions.

In the reliability test of the quality evaluation system of online English teaching under the MOOC platform, if the corresponding average value of the overall coefficients in each dimension is above 0.8, it means that the system model has good reliability for Cronbach’s alpha coefficient test indicator. CR represents the combination of the reliability of all measurement dimensions. The larger the

corresponding value is, the higher the degree of consistency between the dimensions of the system model would be. When the corresponding value is greater than 0.6, the CR of the latent variables is assessed as good. AVE is used to calculate the explanatory power of the variation between the latent variable and the measured variable. The larger the corresponding value is, the better the reliability and the convergence validity of the system model would be. The corresponding value should be above 0.50 concurrently. The MIIC measurement uses the mean correlation coefficient between each factor and the full-scale item to achieve the test for the homogeneity of the scale. The corresponding coefficient value has nothing to do with the number of measured items. Generally speaking, its value should be above 0.40, indicating that the reliability of the overall online English teaching quality evaluation system is high [12]. Except for Cronbach’s alpha coefficient value of the teacher-student relationship dimension below 0.90, the value of this coefficient is above 0.90 in other dimensions. It can be considered that Cronbach’s alpha coefficients of all dimensions in the evaluation system have reached an ideal state. Also, the CR between the dimensions is assessed as good, and the convergence validity is ideal. Hence, the English teaching quality evaluation system under the MOOC platform has good stability and consistency. By combining the MOOC learning recommendation method for learning sequence and similarity distance analysis with the test of the online teaching quality evaluation system, it is found that the interaction between teachers and students or the learning effect and learning attitude of students all show the characteristics of high stability and consistency in the system regardless of the teacher-student relationship. Therefore, the improvement of the accuracy and efficiency of the MOOC platform recommendation has a certain reference and significance to promote the development of teachers and students while coordinating the development and innovation of English major teachers.

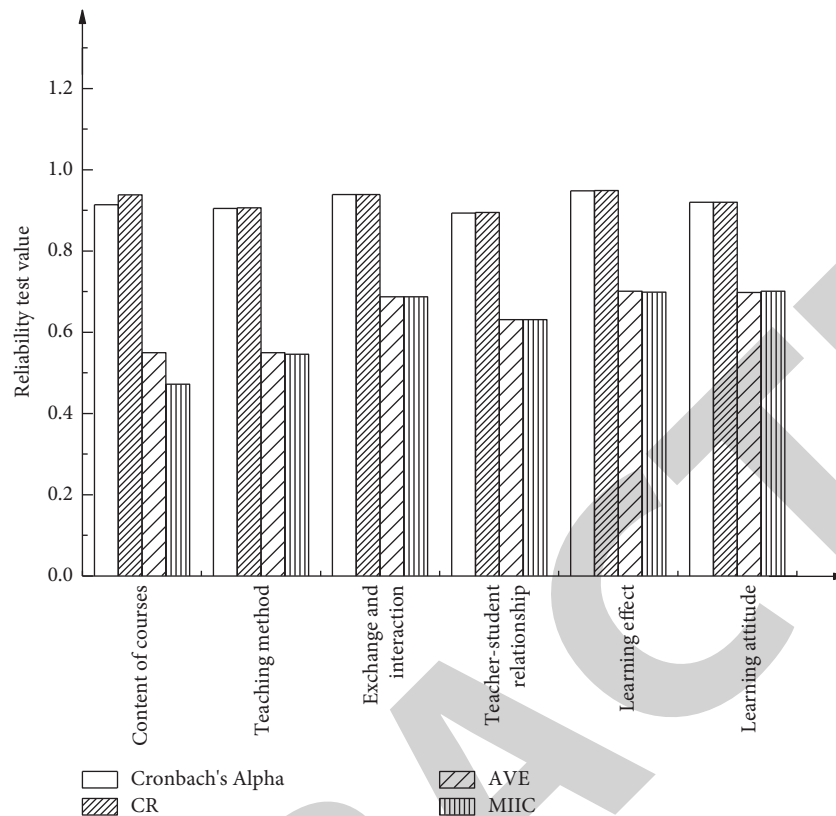


FIGURE 3: Reliability test of the MOOC online teaching for the quality evaluation system.

**3.3. SWOT Analysis of Teacher Development under the MOOC Learning Mode.** In the MOOC learning mode, English plays a pivotal role. Under the MOOC learning recommendation algorithm proposed above utilizing the learning sequence and similarity distance analysis and the test of the quality system of the MOOC online English teaching courses, this paper introduces the SWOT analysis method that focuses on the impact of the MOOC learning mode on the comprehensive development of English teachers. The analysis results of the strengths and opportunities as well as weaknesses and threats of teacher development in the MOOC environment are shown in Figure 4.

Figures (1) through (13) indicate the specific indicators of the SWOT analysis under the MOOC platform, which are (1) language strengths; (2) distinction between curriculum advantages and disadvantages; (3) providing teaching materials; (4) own demand; (5) learning from the MOOC platform resources; (6) enriching knowledge system; (7) teaching concept; (8) work interest; (9) online Q & A; (10) time and energy; (11) course development technology; (12) lack of team building; (13) English used for specialized purposes.

Through the SWOT analysis, it is found that English teachers at the college level can distinguish the advantages and disadvantages of the curriculum in terms of strength development. They can provide language tutoring and course selection for learners participating in the MOOCs. Also, they can be responsible for online Q & A activities and the overall proportion is about 70%. Their professional

knowledge is one aspect that teachers can expand concurrently. From the perspective of opportunity, learning from the existing MOOC resources in teaching can further broaden the development direction of the specialized English and give full play to their language advantages in the context of the MOOC. The weaknesses and threats faced by English teachers in the MOOC platform are characterized by limited time and energy. Furthermore, teachers do not have the skills to develop online courses and lack the necessary team building, with the overall proportion distributed around 70%. In the MOOC platform, English teachers tend to be familiar with English language teaching or the culture of English-speaking countries, but they do not have a high degree of participation in specialized English courses.

English teachers have a solid English foundation and rich teaching experience when participating in the teaching of the MOOC platform. Also, they have a clear understanding of their needs. Therefore, they can learn more new teaching concepts, enrich their professional knowledge system, expand their horizons, and participate in team building and development to a certain extent. The MOOC platform creates an opportunity for teachers to combine language development and specialty. However, due to the lack of self-confidence, the MOOC platform has become a disadvantage. In terms of knowledge renewal and cognition of classroom teaching, it is also a disadvantage for teachers. However, if teachers dare to try it, it is entirely possible to turn this disadvantage into an advantage. With the help of the MOOC platform, teachers

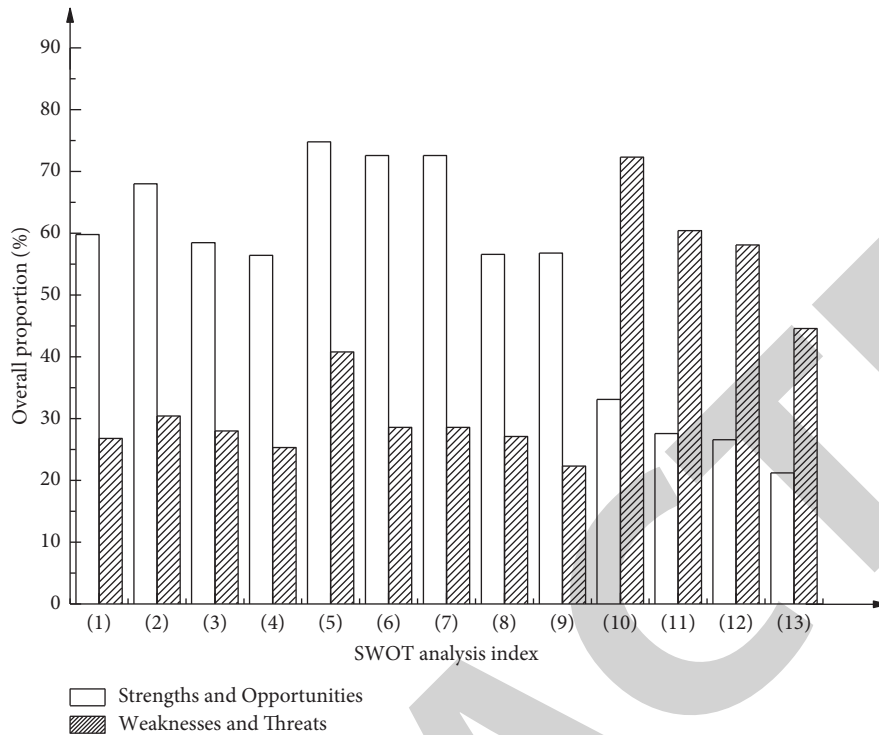


FIGURE 4: SWOT analysis of teacher development under the MOOC online learning platform.

can improve the level of online teaching, expand the electronic stability program (ESP) development path, give full play to their language advantages, and help promote English learning by actively extracting knowledge from the primitive resources provided by the MOOC platform. The needs of students can be accurately positioned while developing special courses. The teacher participation is improved in the MOOC platform while promoting the professional development of English teachers to make teachers steadily advance on the road of combining language development and specialty. In the application and participation of the MOOC platform based on education innovation, the revolution and innovation of their career development and teaching concepts are further improved.

#### 4. Conclusions

This paper conducts a study on the impact of the development of English teaching at the college level in Hunan Province under the “Double First-Rate” background by running the application of the MOOC online education and learning platform. Then, the MOOC learning recommendation algorithm is proposed concerning the learning sequence and similarity distance analysis. When combined with the reliability assessment method of the system model, the quality evaluation system of the MOOC online English teaching is tested. Afterward, the SWOT analysis method is utilized to analyze the impact of the MOOC online learning platform on the professional development of English teachers.

The results show that the MOOC learning recommendation algorithm has higher accuracy and efficiency.

The recommendation of the prerequisite and subsequent learning content is more detailed. When combined with the correction of learning performance concerning the decay of time forgetting, the accuracy of the MOOC learning recommendations is significantly improved. For the reliability test of the quality evaluation system of the MOOC online English teaching, the CR between various dimensions in the system is better, and the convergence validity is higher. Facing strengths and opportunities, teachers should give full play to their advantages and seize opportunities. For the difficulties and challenges, it is necessary to actively learn from the MOOC resources that improve the teaching concept, advance the teaching level, and pay attention to the development of the characteristic courses. Therefore, it is possible to turn disadvantages into advantages and promote the comprehensive development of English teachers’ profession and occupation.

#### Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

#### Conflicts of Interest

The author declares that there are no conflicts of interest.

#### Acknowledgments

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