

## *Retraction*

# **Retracted: Language Intelligence Development of English Multimedia Teaching considering Collaborative Filtering Topic Search Algorithm**

### **Advances in Multimedia**

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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] X. Zhu and F. Huang, "Language Intelligence Development of English Multimedia Teaching considering Collaborative Filtering Topic Search Algorithm," *Advances in Multimedia*, vol. 2021, Article ID 2120993, 7 pages, 2021.

## Research Article

# Language Intelligence Development of English Multimedia Teaching considering Collaborative Filtering Topic Search Algorithm

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With the opening up of our country, English has become one of the necessary skills for foreign communication. Traditional English teaching can no longer meet the needs of learning. It is necessary to introduce computer, multimedia, and other technologies to supplement students to improve students' autonomous learning ability and learning interest. This is extremely important for the evaluation of English multimedia teaching. Based on the collaborative filtering topic search algorithm, this article tries to sort out the influence of English synthesis and English specialization on the development of language intelligence for English multimedia teaching and analyzes and promotes the improvement of students' interest in learning English and the improvement of classroom self-learning awareness. The results of simulation experiments show that the collaborative filtering topic search algorithm is effective and can support the development of language intelligence in English multimedia teaching.

## 1. Introduction

With the continuous development of social economy, the international affairs of foreign exchanges are also increasing, and English has become one of the necessary skills for foreign exchanges [1–4]. Computer technology and multimedia technology can quickly assist students to master the English language. At the same time, for students, traditional English teaching methods have gradually been unable to meet the learning needs of students. Therefore, multimedia teaching methods have gradually been introduced to explore English teaching [5–7].

English teaching not only promotes students' language learning and language sense learning but also enhances students' language intelligence development. For each student, the development of linguistic intelligence varies from person to person. There is a wholeness, that is, linguistic intelligence is inseparable from logic, language, communication, etc., but there are also differences, and personal

understanding and accepting abilities vary with each other. Therefore, students are required to develop corresponding language intelligence in continuous practice.

It should be noted that the Intelligence development of language puts forward certain requirements for both teachers and teaching. On the one hand, teachers can obtain corresponding teaching feedback according to the corresponding teaching of English through corresponding English teaching, which helps students to meet the needs of language Intelligence development. Improve teaching contents and methods; On the other hand, students can accurately find out the shortcomings and weaknesses in their learning according to the teaching evaluation system, and whether they master the language to adjust their learning, so as to better choose and improve their learning methods [8–10]. Therefore, simply using test scores as a criterion for evaluation cannot fully clarify the quality of English teaching. It can neither arouse students' interest in learning English nor improve teachers' teaching quality [11, 12].

Therefore, despite the continuous enrichment of English teaching resources, there are still certain limitations. Therefore, despite the continuous enrichment of English teaching resources, there are still certain limitations. Therefore, this paper proposes a collaborative filtering topic search algorithm combined with multimedia English teaching method to improve the quality of English multimedia teaching. The experimental results show that this method has certain advantages in language intelligent development.. The development is aimed at exploring the scientificity and effectiveness of English multimedia teaching and immersing students in the English learning situation.

## 2. Collaborative Filtering Topic Search Algorithm

**2.1. LDA Model Introduction.** For the collaborative filtering topic search algorithm, the first is to clarify the simplest LDA model. Its essence is the topic model. The specific model flowchart is shown in Figure 1.

$K$  is set as the number of topics, as a vector, which can be used to represent the corresponding attribute value. At the same time,  $\alpha$  is set as a superparameter, which is mainly used to control the distribution of topics. The specific process of the specific LDA algorithm is as follows.

$$X_{ij} \sim N(U_i^T V_j, C_{ij}^{-1}). \quad (1)$$

**2.2. CTR Model Introduction.** The CTR model is a probabilistic topic model, an enhanced model based on the LDA model, and the specific flowchart is shown in Figure 2.

The specific process of the CTR model is shown in Algorithm 2.

For the set weight parameters  $C_{ij}$ , see the formula for specific calculation:

$$C_{ij} = \begin{cases} a, & \text{if } X_{ij} = 1, \\ b, & \text{if } X_{ij} = 0. \end{cases} \quad (2)$$

Here  $a$  and  $b$  are control parameters, satisfying  $1 \geq a > b > 0$ .

Based on the CTR model, this paper proposes a new topic search algorithm DTTR based on collaborative filtering.

$$X_{ij} \sim N(U_i^T V_j, C_{ij}^{-1}). \quad (3)$$

**2.3. Collaborative Filtering Topic Search Algorithm (DTTR).** Different from the LDA model and CTR model, the DTTR model is a collaborative filtering search algorithm based on two-way topic model. Its specific process is shown in Figure 3.

The specific process of the model is shown in Algorithm 3.

In order to learn the parameters of the model, we propose an EM algorithm similar to the existing results. The parameters of the model can be obtained by maximizing formula (2) in this paper, as shown in the following formula:



FIGURE 1: LDA model.

$$L(U, V) = - \sum_{ij} \frac{C_{ij}}{2} (R_{ij} - U_i V_j^T)^2 - \frac{\lambda_u}{2} (U_i - \theta_i)^T (U_i - \theta_i) - \frac{\lambda_v}{2} (V_j - \theta_j)^T (V_j - \theta_j) + \sum_j \sum_n \log \left( \sum_k \theta_{jk} \beta_{k, w_{jn}} \right). \quad (4)$$

By setting the fixed parameter  $V$  to achieve the corresponding derivative, the following formula can be obtained:

$$U_i = (VC_i V^T + \lambda_u I_K)^{-1} (VC_i R_i + \lambda_u \theta_i), \quad i \in [1 \sim I]. \quad (5)$$

Similarly, the formula for solving  $V$ : is obtained, as shown in the following formula:

$$V_j = (UC_j U^T + \lambda_v I_K)^{-1} (UC_j R_j + \lambda_v \theta_j), \quad j \in [1 \sim J]. \quad (6)$$

**2.4. Study Sample.** Appropriate samples were selected for the corresponding simulation experiment of the collaborative filtering topic search algorithm to specifically understand students' feedback on language Intelligence development under multimedia English teaching. The corresponding number of students was selected. The experimental class to be tested was 40, and the sample verification class was also 40, including a total of 20 boys and 60 girls.

**2.5. Research Programme.** The same teaching environment, English teaching schedule, class hour allocation, and teaching environment are selected for the experimental class and the sample verification class. In order to avoid the experimental class and the sample verification class being affected by the outside world, neither the tested students nor the teachers know to participate in the corresponding research.

For the experimental class, the teaching mainly includes the following characteristics.

Input: hyperparameter  $\alpha$ , vector  $\beta$ .  
 Output: get the recommended topic distribution, which is represented by  $\theta_j$  here. The recommended item  $j$  has the following characteristics.  
 (i) First obtain the corresponding topic distribution.  
 (ii) For each word  $w_{jn}$  in the recommended item, it must obey the distribution of the corresponding polynomial.

ALGORITHM 1: The running process of the LDA model.

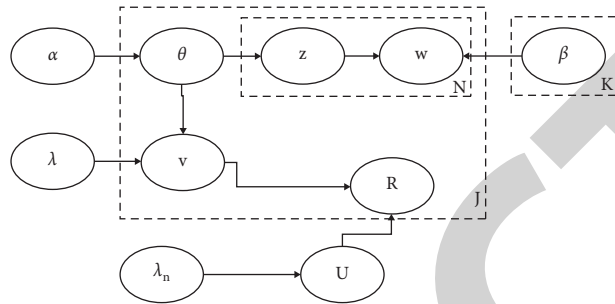


FIGURE 2: CTR model.

Input: the user's regularization coefficient  $\lambda_u$  and the recommended item's regularization coefficient  $\lambda_v$ .  
 Output: the approximation matrix  $X$  of the matrix  $R$ .  
 ① For each user  $i$ , first extract the corresponding feature vector, namely,  $U_i \sim N(0, \lambda_u^{-1} I_K)$ ;  
 ② For each recommended item in text form  $j$ ;  
 (i) Use the LDA model described in Algorithm 1 to get the topic distribution  $\theta_j$ .  
 (ii) Get the potential variance of recommended items  $\epsilon_j$ ,  $\epsilon_j$  to satisfy the distribution  $N(0, \lambda_v^{-1} I_K)$ .  
 (iii) Get the feature vector of the recommended item  $V_j = \theta_j + \epsilon_j$ .  
 Is  $V_j \sim N(\theta_j, \lambda_v^{-1} I_K)$ .  
 ③ For each scoring point  $(i, j)$ , the corresponding prediction score is obtained, as shown in the following formula:

ALGORITHM 2: The running process of the CTR model.

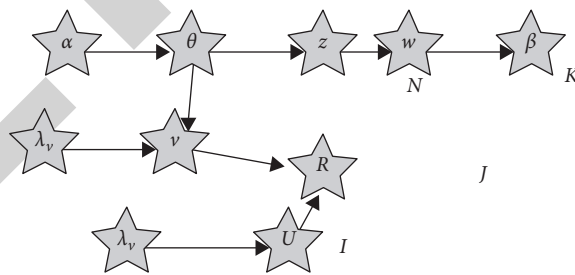


FIGURE 3: Flowchart of collaborative filtering topic search algorithm.

2.5.1. *Cooperation.* First of all, the corresponding research and survey are carried out, and the initial language intelligence of students is mapped out, and the communication, language, language sense, and logic are classified, respectively. Those with similar language intelligence are divided into a group, which can not only facilitate timely and effective completion of tasks but also facilitate quick and convenient communication [13–15].

Students with the same intellectual tendency are grouped together, which not only facilitates them to adopt a learning method suitable for their own intellectual characteristics to

complete group tasks but also creates a competitive and diversified learning atmosphere between groups.

2.5.2. *Multicultural Education.* The corresponding teaching content has been added to develop into more diversified courses, such as the origin, evolution and influence of culture, historical events, innovation and impact of thought, and so on, all of which need to be traced back to the source, so that students can accurately understand the context of history and culture and more effectively grasp the course learning of English.

Input: user's regularization coefficient  $\lambda_u$  and the regularization coefficient of the recommended item  $\lambda_v$ .  
 Output: approximation matrix  $X$  of matrix  $R$ .

- ① For each user  $I$ ;
  - (i) Get its subject distribution  $\theta_i$ .
  - (ii) Get the potential variance of users  $\varepsilon_i$ ,  $\varepsilon_i$  to satisfy the distribution  $N(0, \lambda_u^{-1} I_K)$ .
  - (iii) The eigenvector of the user is obtained  $U_i = \theta_i + \varepsilon_i$ , which is  $U_i \sim N(\theta_i, \lambda_u^{-1} I_K)$ .
- ② For each text form of the recommended item  $J$ ;
  - (i) The LDA model described in Algorithm 1 is used to obtain the topic distribution  $\theta_j$ .
  - (ii) Get the potential variance of the recommended items  $\varepsilon_j$ ,  $\varepsilon_j$  to satisfy the distribution  $N(0, \lambda_v^{-1} I_K)$ .
  - (iii) The eigenvectors of the recommended items are obtained  $V_j = \theta_j + \varepsilon_j$ , which are  $V_j \sim N(\theta_j, \lambda_v^{-1} I_K)$ .
- ③ For each score point  $(I, j)$ , the corresponding predicted score was obtained:

ALGORITHM 3: Operation process of DTTR model.

2.5.3. *Diversified Activities.* On the basis of multicultural education, it is through carrying out corresponding diversified activities, such as making Thanksgiving cards, understanding the history of Thanksgiving, feeling the true meaning of Thanksgiving, and making multimedia displays, such as PPT, video, audio, etc., according to their own learning experience, not limited to any form.

## 2.6. Test Tools

2.6.1. *Comprehensive English Proficiency Test.* For English multimedia teaching, it not only includes the traditional reading and learning but also includes writing, dialogue, listening, and other aspects of learning. Select the corresponding test papers to evaluate the comprehensive ability, and the dialogue is the corresponding oral test.

2.6.2. *Multiple Intelligence Questionnaire.* The corresponding tests are conducted through different intelligent questionnaire contents, different question methods are set for each topic, and English is required to answer, which can ensure the credibility of the questionnaire.

2.6.3. *Teaching Questionnaire.* The teaching questionnaire is mainly aimed at students' learning situation, truly feeling students' evaluation of English multimedia teaching, and investigating students' favorite teaching forms and suggestions.

## 2.7. Data Collection and Analysis

2.7.1. *Pre- and Posttest.* The so-called pretest and posttest are determined according to the schedule. The pretest mainly focuses on the comprehensive English ability, including listening, reading, collaboration, and so on. At the same time, it assists the corresponding intelligent research and group teaching according to the structure of students' Intelligence development.

In the posttest, the latter part of the test is chosen, and the corresponding comprehensive ability test is carried out again, and the questionnaire survey is carried out.

2.7.2. *Test Paper Grading.* Set the corresponding standard answers; in addition to the objective questions and subjective questions by a number of teachers to review, set the corresponding evaluation standards and finally, through the weighted synthesis, get the final scoring standards.

2.8. *The Preparation Process of English Multimedia Teaching Mode.* For English multimedia teaching, the development of language intelligence theory is mainly reflected in the following aspects: (1) English language expression; (2) students' logical thinking and reasoning; (3) language sense cultivation, visual space, and body movement; (4) the ability of self-reflection and self-improvement; (5) cooperative learning; and (6) paying attention to the observation of nature [16–18]. Multimedia teaching has promoted students' learning attitude from "want me to learn" to "I want to learn enhancing their learning motivation and sense of self-efficacy. They believe that "different from the lifeless classroom atmosphere in the past, everyone wants to actively participate and change the situation where they dare not say and are afraid of making mistakes." The learning exchange among students has been increased in the classroom, and students have gradually become the leader of learning.

The theory of multiple intelligences aims at analyzing the diversity of students' intelligence and students' individual differences. In the process of analysis, it fully considers students' individual differences, applies different intelligent and personalized teaching methods, mobilizes students' participation enthusiasm as much as possible, and does not use traditional learning standards to require and evaluate students' achievements. This theory embodies the "people-oriented" and the teaching concept of "student development oriented."

For different students, there are differences in intelligence because of their different congenital inheritance and acquired development. This requires teachers to truly understand the specific situation of students through interview, questionnaire survey, classroom observation, and comprehensive application before class, formulate personalized teaching mode, answer students' confusion about animation writing teaching mode, and improve students recognition of their teaching.

By using this survey method, teachers can find the existing problems in English writing teaching, mainly for the lack of understanding of students' basic situation in the teaching process and the single teaching method. At the same time, students' learning difficulties are mainly reflected in the lack of interest in writing and lack of writing materials. In the process of students' learning, teachers can find that students are always learning sentence patterns and templates to a great extent. For some new topics and problems, students still use the traditional English template. This model completely violates the original intention of English writing teaching [19, 20].

## 2.9. Simulation Experiment and Analysis

**2.9.1. The Influence of This Teaching Mode on Students' Comprehensive English Ability.** This paper selects two test methods for comparison, as shown in Figure 4. According to the students' learning time and English test results, it can be found that there is little difference in English level among students, but after applying the collaborative filtering topic search algorithm to English multimedia teaching, the students' English comprehensive score is significantly higher than the sample score, indicating that the effect of the algorithm proposed in this paper is better. Therefore, compared with the corresponding indexes, the average score of the experimental class to be tested was significantly higher than that of the sample verification class in the second test. By changing the model, it can be concluded that learning motivation is stimulated, and their learning motivation and sense of self-efficacy are enhanced, thereby enhancing the cultivation of students' comprehensive English ability.

**2.9.2. The Influence of This Teaching Mode on Students' English Specific Skills.** In order to further compare the changes of students after teaching English multimedia, this paper also makes a further comparison and investigation on the scores of the subitems. As shown in Figure 5, from the results, there is no significant difference between the experimental class to be tested and the sample verification class in English reading, writing, speaking, and other skills at the beginning, but after multimedia teaching, the experimental class to be tested has made significant progress in speaking and reading, indicating that the experimental class to be tested has made significant improvement in the intelligence development of these two languages. Through the index detection of the collaborative filtering topic search algorithm, it is obvious that the experimental class to be tested has made greater progress, which is significantly different from the sample verification class. Through this model, students generally report greater progress in listening, speaking, and writing. Some students wrote the following. "In debates and group discussions, you must first understand what others are saying; otherwise, you do not know what point of view you should express. This greatly improves my listening." "According to the students' response at the training site, exercise the students' language organization and oral expression ability."

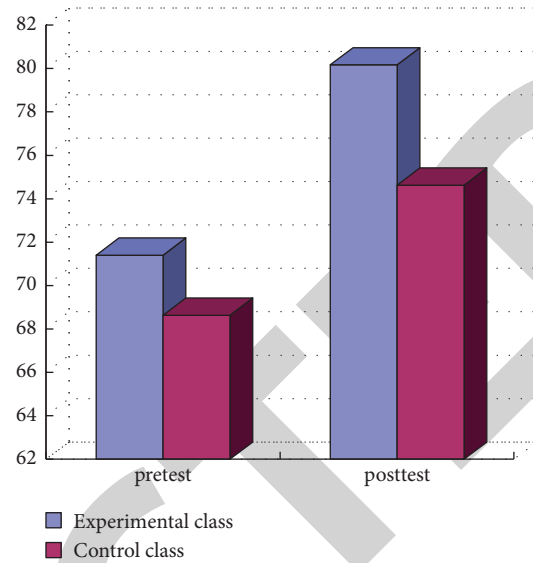


FIGURE 4: Comparison of comprehensive English ability between groups and within groups.

**2.9.3. The Influence of This Teaching Mode on Students' Intelligence Development.** According to the calculation results of the collaborative filtering topic search algorithm, firstly, before the experiment, the difference of logic and natural environment intelligence between the experimental class to be tested and the sample verification class is obvious, and the experimental class to be tested is relatively weak. However, after corresponding experiments, there is little difference between the two on these indexes.

**2.10. Experimental Class Teaching Questionnaire Results.** According to the corresponding questionnaire survey, more than 80% of students are satisfied or relatively satisfied with English multimedia teaching. The students' gains are mainly reflected in the following aspects.

**2.10.1. The Subjective Initiative of Learning Is Enhanced.** From the initial passive acceptance to the present "I want to learn," I have enhanced the initiative of subjective learning and also have a certain sense of efficacy. We communicate with each other more frequently and also increased the corresponding learning experience communication.

**2.10.2. Improvement of the Relevant Special Skills Learned.** Especially in the traditional teaching process of listening, speaking, reading, and writing, students are unwilling to communicate and perform in learning because of subjective and objective factors. As long as more students are involved in the process of multimedia English teaching, they can improve their learning enthusiasm by means of English speech videos and so on.

**2.10.3. Comprehensive Quality Has Been Improved.** The diverse tasks strengthen students' in-depth understanding of English, not only the language itself, but also the culture of

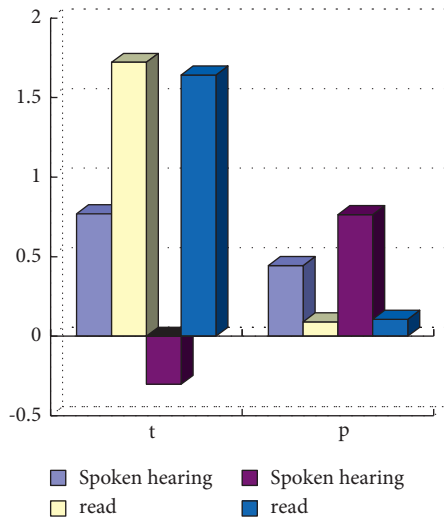


FIGURE 5: Comparison of English specific skills between groups and within groups.

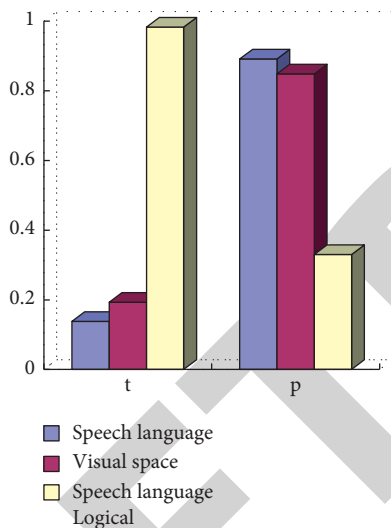


FIGURE 6: Comparison of inter-group and intra-group intelligence development.

the English-speaking countries. Through learning, understanding, and communication of online resources, students' abilities in listening, speaking, reading, and writing have been improved, and their comprehensive quality has also been improved, as shown in Figure 6.

### 3. Conclusions

Multimedia English learning provides English learners with better technical support and learning concepts. Therefore, it is necessary to improve the quality of multimedia English teaching. The search algorithm proposed in this paper analyzes the law of English intelligent development by combining the requirements of multimedia English teaching, so as to improve students' comprehensive communication and language and logic ability, improve students' awareness of

actively participating in classroom interaction, and then improve the quality of English multimedia teaching. Simulation results show that the collaborative filtering topic search algorithm is effective.

### Data Availability

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

### Conflicts of Interest

The authors declare that they have no conflicts of interest.

### Acknowledgments

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