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Research Article

Research on Data Retrieval Algorithm of English Microlearning Teaching Based on Wireless Network Information Classification

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This paper introduces a data retrieval algorithm for teaching English microlearning based on the classification of wireless network information. There are two main types of information extracted from social network information: trust relationship and similarity relationship. To be able to make full use of these two kinds of information, they are then divided into two parts, respectively, namely, explicit and implicit trust relationships and global and local similarity relationships. Then, this paper proposes an adaptive adjustment of the weights, which can better model the user's selection tendency. Finally, adequate experiments are conducted on two experimental data sets, and the retrieval model shows the best results, demonstrating that the impact of data sparsity on retrieval performance can be mitigated through the use of social network information. The general approach to the production of college English microcourse is described in terms of design principles, teaching analysis, teaching session design, script design, and recording processing, and the study of data retrieval algorithms for college English microcourse based on social network information classification is conducted in three stages: before, during, and after the class. It is verified through practice that the application of social network information classification to college English microlearning helps to improve learning interest, learning efficiency, independent learning ability, and thinking inquiry ability and provides certain teaching suggestions for college English microlearning based on practical feedback.

1. Introduction

With the development of information technology and econometrics and the continuous improvement of knowledge mapping technology, the quantitative research method, which takes social network information classification as the research object, has received more and more attention and has developed rapidly. The discipline-related research using this method is still in the primary stage, and the research fields are mostly limited to management, library, and intelligence and then gradually expanded to education and other fields [1]. Among them, the literature research on English microcourse teaching in colleges and universities is in its infancy, and there are few relevant research materials, most of which focus on the overall development of secondary vocational education, such as the current situation of research and analysis of research hotspots [2]. There are also few studies focusing on microlevel, such as the analysis of a specific teaching method and the investigation of a specific discipline, but there are few studies on the microcourse teaching methods of English in colleges and universities. What is the development of microcourse teaching in English in higher education? What are the hotspots and frontiers of research on English microteaching methods in higher education? There is not an accurate and comprehensive overview of these. Therefore, based on theories related to social network information classification, we can construct a new model of English microcourse teaching in colleges and universities, explore the reform and development of English microcourse teaching methods in colleges and universities, and provide reference and theoretical basis for the selection and innovation of English microcourse teaching methods in colleges and universities [3].

Mining and analyzing social network data has important uses in many aspects, and more and more people are designing and developing systems for related research. Most of the current social network data analysis systems focus on one aspect, some are for analyzing user behavior in social networks, some are for analyzing user relationships in social networks, some are for analyzing text sentiment in social networks, and some are for mining hot topics in social networks [4]. Most of the analysis work is for a specific social network data. Therefore, it is important to develop a system that can analyze data from multiple heterogeneous social networks in a comprehensive way. With this goal, this paper designs and develops a social network big data analysis system, which is based on social networks, realizes the collection, retrieval, analysis, and visualization of large-scale social network data, and provides the government and enterprises with help of public opinion monitoring, market research, and other aspects [5].

This paper systematically sorts out the teaching methods that meet the actual situation of English microcourses in colleges and universities based on the data search of English microcourse teaching in colleges and universities. According to the research hotspots of English microcourse teaching methods in colleges and universities and the cutting-edge research results in this field, advanced teaching methods that meet the characteristics of English microcourse teaching in colleges and universities are screened out based on the actual situation of English microcourse teaching in colleges and universities. The first chapter is the introduction, and this chapter mainly introduces the project background and significance of the social network big data analysis system which are elaborated, and finally, the main work of this article is summarized. The second chapter is related work, which mainly introduces the current situation of domestic and foreign research, research methods, research contents, and innovation points and lays the foundation for the subsequent construct analysis and teaching practice of the network information classification of English microcourse teaching methods in colleges and universities. The third chapter is research on data retrieval algorithm for college English microcourse teaching based on social network information classification, which introduces the core concepts of the research and theories related to the knowledge graph, clarifies the theoretical guidance significance of these theories for the research of this paper, and also analyzes the research on the algorithm and system design. Section 4 is the analysis of the results. This chapter introduces the specific implementation and testing of the social network big data analysis system, shows the main function interface of the system, and tests the main functions of the system in detail to ensure that the system can operate normally and is safe and reliable. Section 5 is the conclusion and outlook, which summarizes the research work of this paper, points out the shortcomings in the research, and outlooks the future research direction.

2. Related Work

With the gradual development of internet technology and the reform of teaching mode in the education sector, more teaching resources have been presented through internet technology, such as microcourse teaching management system, blended learning, and creative space [6]. Compared with traditional classroom teaching methods, these new online teaching methods with rich teaching contents, flexible teaching methods, and fast updating of teaching knowledge have been widely [7]. At the same time, these teaching methods can also be used for online learning through broadband networks and mobile internet, which greatly meet the personalized learning needs of teachers and students [8]. Kirsch et al. carried out the microcourse competency competition project when the microcourse competency competition used the microcourse resource content, teachers' teaching quality, and students' learning effect to evaluate the microcourse teaching as a whole, which made the microcourse teaching evaluation system more perfect [9]. Rudio et al. analyzed the microcourse knowledge education process of college English, each person's different English learning ability, and other problems [10]. Kong used multimedia technology to implement a microclassroom teaching system for teaching the whole English course [11]. The system uses multiple stepwise regression analysis models using statistical analysis to measure the effectiveness of English teaching in terms of both quality level and benefit level, and it is experimentally concluded that the model has a good ability to assess the effectiveness of English teaching with a confidence level of over 95% [12].

The research on microcourse topics is not yet satisfactory, and the definition of microcourse topics has not yet reached a consensus in the industry, for example, our Ministry of Education pointed out in the national training for university teachers that microcourse as a new teaching method, it is mainly used to record microcourse knowledge points or complete short video teaching around a certain teaching content. By analyzing the relationship between learning effect and course content, course teaching methods, and interest in the current teaching process, Liu proposed that the course teaching method with microlesson teaching is one of the best teaching methods in the current course teaching methods [13]. Ma et al. analyzed that although modern microlesson education has the advantages of distinct and prominent themes, short and concise content, and simple and novel form, it is difficult to evaluate the quality of microlesson in the process of specific application to microlesson teaching [14]. Chu et al. obtained the core content of microlesson teaching by analyzing the ontological characteristics of microlessons and designed and implemented a university English microlesson teaching management system, which contains functions such as course information, microlesson teaching, online examinations, online communication, and homework correction, which effectively strengthens the frequency of teacher-student interaction before, during, and after class, enhances the connection between teachers and students, and improves students' interest in foreign language learning [15].

This paper mainly works on the research of data retrieval algorithm of college English microcourse teaching based on social network information classification and researches the microcourse teaching data retrieval algorithm which is in line with the actual college English microcourse teaching by analyzing the problems of backward teaching methods, insufficient vivid teaching contents, confusing teaching resource management, poor teaching quality, and weak teacher-student interaction in the current college English

microcourse teaching process [16]. Because of the current problems of confusing resource management, the low utilization rate of resources, and poor sharing of resources in English microcourse teaching in colleges and universities, the microcourse video resource management module is designed and implemented by using the way of social network information classification, which is divided into different grades and classes for classification management according to the type of microcourse resources. Teachers can manage microcourse courseware, microcourse lesson plans, and microcourse test questions conveniently, while students can also browse microcourse resources through the microcourse. At the same time, students can browse and download microlesson resources through the microlesson resource management module, which effectively improves the utilization and sharing of microlesson resources. The system effectively improves the efficiency of microlesson teaching and achieves the purpose of improving the quality of microlesson teaching.

3. Research on Data Retrieval Algorithm for English Microlearning Teaching

3.1. Research on Teaching Microlearning Based on Wireless Network Information Classification. In traditional large classrooms, students often take a chance and are reluctant to raise their hands to answer questions, express their opinions, and participate in activities. English microlearning provides a knowledge input and output platform for everyone, and everyone can participate in the teaching interaction. English microlearning breaks the limitation of time and space, and students can learn on this platform anytime and anywhere. In addition, teachers can create all kinds of teaching activities according to the needs of their courses. The platform introduces experience value, which can be enhanced while students complete learning tasks, and there is an experience value ranking to effectively stimulate students' interest. Students can participate in any teaching activities through their mobile terminals, and after the activities are finished, students can view other people's opinions to pool their ideas, improve themselves, and make progress together. English microlessons support the function of liking and commenting. For the answers uploaded by students, teachers can promptly give feedback to students by criticizing, commenting, and liking. The students can also interact with each other by commenting and liking. Figure 1 shows the framework of the English microlesson teaching function.

Before teachers prepare a course, they should conduct front-end analysis based on the actual situation of students, the difficulty of the teaching materials, and the operation of the teaching platform to determine specific teaching objectives, and according to the teaching content, followed by the design, development, and collection of appropriate teaching resources, mainly containing microlessons, news, documentaries, movies, TED talks, and other video resources related to the subject content, supplemented by knowledge-based explanation text, PPT courseware, audio, pictures, and links to hot tweet. To motivate students to participate in learning, the teacher initiates the creation of online learning activities, such as brainstorming, Q&A discussions, voting, drawing mind maps, and other independent learning activities. Teachers can upload and publish teaching resources with experience values set by screening to English microclasses anytime and anywhere and publish independent learning tasks and requirements that students should complete before class, and English microclasses will automatically send task message notifications to students' mobile terminals.

Students enter the corresponding class for independent learning by their class number according to the teacher's requirements. Students can set their own learning time, place, pace, and mode and complete their preliminary knowledge construction through independent learning of teaching resources and participation in online learning activities; they can also raise their questions through the communication function in the classroom and can also bring them to the offline classroom for discussion. English microclasses can automatically record students' learning data, rank them by experience value, make an intelligent evaluation of students, and also divide groups, to help teachers monitor, manage, and evaluate. In addition, teachers can encourage students through likes, comments, and gifts to motivate them to learn and build a relaxed and fun teacher-student relationship. Of course, students and students can also evaluate each other, and after the teacher finishes the task activity, students can view other students' answers in real-time to broaden their ideas, improve problem solutions, and achieve common progress.

The information retrieval module mainly realizes the establishment of a full-text index of the merged social network data and searches, and the retrieved data is used for data analysis. There are mainly two retrieval methods: new task retrieval and current task retrieval. New task search refers to start a new task search without retaining the data obtained from the previous search. The current task retrieval refers to keeping the data retrieved from the previous task, and then starting new task retrieval. The data retrieved from the new task and the data retrieved from the previous task are intersected or unboned to achieve the fusion of multitask data.

3.2. Teaching Data Retrieval Algorithm. In information retrieval, the main purpose of data retrieval methods is to combine search results from different retrieval systems to generate a new search result to improve retrieval performance. Data search methods are divided into two main categories according to the processing of the member systems: data retrieval methods with equal processing and data retrieval methods with different processing.

In the linear combination method, since different retrieval systems make different contributions in the data retrieval process, if a member system has good retrieval performance or plays an important role in improving the performance of the final data retrieval results, it will be given a larger weight in data retrieval; if a member system has a lower performance or makes less contribution in data retrieval compared to other systems If a member system has low performance or contributes less to data retrieval than other systems, then it is given less weight [17]. After the weights are assigned, the linear combination method multiplies the scores of each document in the search results of different member systems by the weights of the member systems that retrieved the document and then adds them in turn to obtain the global scores. Equation (1)

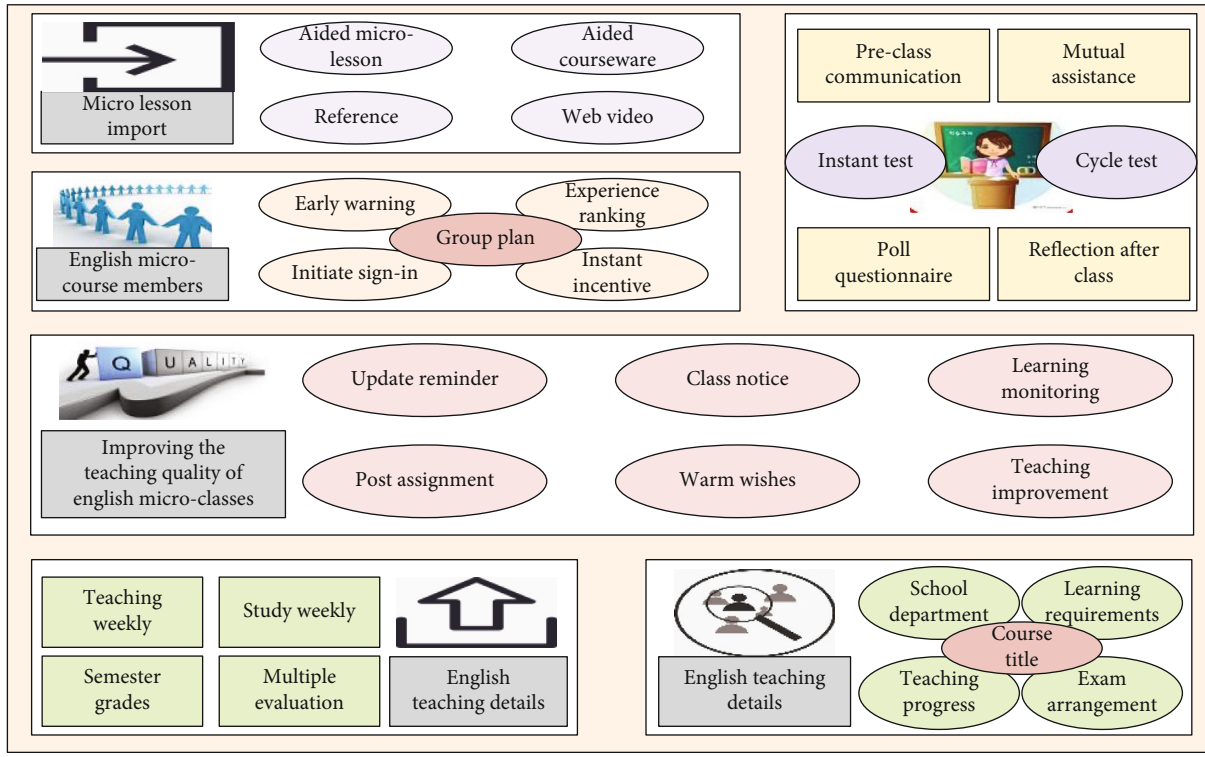

Figure 1: Functional framework of English microlearning.

of the linear combination method shows that $q_i(x)$ denotes the score given to document x by the ith member system, and p_i denotes the weight of the ith member system.

$$f(x) = \sum_{i=1}^{n} p_i \times q_i(x). \tag{1}$$

In the differential evolution algorithm, the mutated individual vector is obtained by multiplying the differential vector of individuals in the population with the scaling factor and then adding it to another vector of individuals in the population. There are many ways to generate the variant individual vectors, and the corresponding differential variation strategies are also different. The differential variation method DE/rand/1 is shown in Equation (2), where $h_1 \neq h_2 \neq h_3 \neq m$ and H is the scaling factor.

$$g(m, x) = y(h_1, x) \times m + H \times (y(h_2, x) - y(h_3, x)). \tag{2}$$

The crossover operation of the differential evolution algorithm generates the experimental individual vector, which will retain some dimensional components of the variant individual vector through the crossover probability CR. The formula of the crossover operation is shown in Equation (3), where $n = 1, 2, 3, \cdots M$, rand (n) is a randomly chosen integer within $[1, M]$, and CR is the crossover rate.

$$F(m, n, x) = \begin{cases} g(m, n, x), \text{CRI}[0, 1], n = \text{rand}\ (n) \\ h(m, n, x), \text{other}. \end{cases} \tag{3}$$

The adaptive simplified particle swarm algorithm improves the formula for the motion of the particles. As can be seen from the standard particle swarm optimization algorithm particle velocity change formula, the algorithm updates the velocity of the particles during each iteration mainly by the change of the individual polar value q and the global polar value g. However, this does not interact with the information of the individual polar values of other particles. To make full use of the information of each particle's polar value q, the particle motion formula of the swarm algorithm can be changed to Equation (4), where w denotes the inertia weight, A_m is acceleration factors, and B_m is the random numbers in the range of [0, 1].

$$f(x)_{ij}^{n} = qx_{ij}^{n-1} + \sum_{m=1}^{2} A_m B_m \left(g(x_j) - x_{ij}^{n-1} \right). \tag{4}$$

The equations for setting the b1 and b2 parameters are

$$\begin{cases} b_1(x) = 1 - \sqrt{avg(F(x) - gbest(Fx)} \\ b_2(x) = \sqrt{avg(F(x) - gbest(Fx)}. \end{cases} \tag{5}$$

This paper proposes a weight distribution strategy based on adaptive alternating particle swarm differential evolution algorithm. The method mainly uses an exponential function related to the number of iterations as the probability to control the frequency of use of particle swarm algorithm and differential evolution algorithm. In the experimental results, it is found that the weight distribution strategy has a certain effect. When the particle swarm algorithm searches for the optimal solution,

the problem that it often faces is that the initial algorithm quickly converges, causing it to fall into the local optimum and stagnating the search. The reason for this problem is that at the beginning of the algorithm run, the particles in the entire population are random, and the similarity between the particles is low, so that the fitness value corresponding to the particles has a large difference, and the algorithm can be used in the early iteration of the algorithm, quickly converging to the local optimal position. Then according to the formula of the particle swarm algorithm, the movement state of the particles is affected by the group experience and the individual experience. Therefore, as the algorithm converges quickly, the individuals in the population will gradually move toward the location of the local optimal solution. It will cause the difference between individuals in the population to decrease, and the search range of the algorithm will converge to the vicinity of the local optimal solution. At this time, the algorithm will stall.

Let $S(x)$ be a numerical attribute and $\max(S(x))$ and $\min(S(x))$ denote the maximum and minimum values of the attribute, respectively. To prevent the dominant influence of a large number of attributes on the classification, the values fall into the interval $[0, 1]$ according to the attribute normalization, and the attribute normalization formula is

$$S(x) = \frac{S(x) - \min(S(x))}{\max(S(x)) - \min(S(x))}, x \subseteq [0, 1]. \quad (6)$$

The test sample distance in the parallel classification hybrid algorithm is calculated by using the weighted Euclidean distance, combined with the design idea of MapReduce divide and conquer, which is adapted to spread out to p parallel computing nodes, the total number of training samples is n, and the number of feature attributes is s. The algorithm can further improve the computational efficiency of the serial classification algorithm and effectively reduce the time complexity and space complexity of each operation part. The time complexity is adjusted to $O(ns)/p$, and the space complexity is adjusted to $O(n)/x$.

The weighted Euclidean distance is used in the PCHA algorithm proposed in this paper to calculate the nearest neighbour measure of the test tuple and the training tuple, as shown in Equation (7), where the weights are chosen depending on the importance of the data objects d_i and d_j, and the beginning stage is set in a way that all data objects are considered equal. The attribute values are normalized for the attribute values to prepare the data.

$$\left\| d_i - d_j \right\| = \sqrt{\frac{\sum_{k=1}^{m} q_k \left(d_{ik} - d_{jk}\right)^2}{\max\left(d_i, d_j\right) - \min\left(d_i, d_j\right)}}. \quad (7)$$

Implementing MapReduce and proximity algorithm data retrieval designs classification hybrid algorithm, builds an abstract class interface to provide Map and Reduce functions, and specifies input and output and other operational parameters [18]. The Input stage divides the large data set into several independent data sets to facilitate the next step of processing, defined here as M data sets, and stores them in HDFS of the Hadoop system, where they are submitted to the Job Tracker and executed by the corresponding Task Tracker. Since the number of Map nodes is more than the number of Reduce nodes, to save resources, the data are processed in the Combine stage before being submitted to Reduce, and the results of the Map stage are sorted according to the values of the same keys and then submitted to reduce after local filtering.

3.3. Teaching Data Retrieval System Design. Based on the analysis of the research on the teaching mode of English microlearning in colleges and universities, this paper designs a three-stage teaching process including "before class-knowledge transfer," "during class-knowledge internalization," and "after class-evaluation and reflection" for the special characteristics of information technology courses and the specific conditions of schools. The process of the English microlearning teaching model in colleges and universities includes three stages: "before class-knowledge transfer," "during class-knowledge internalization," and "after class-evaluation and reflection." The tasks in the precourse stage are as follows: teachers make microlesson, design independent learning task list, and supervise learning, and students watch microlesson, complete independent learning task list, and record search; the tasks in the midcourse stage are as follows: teachers guide inquiry, guide communication, and guide practice, and students ask questions, communicate and discuss, and practice; and the tasks in the postcourse stage are as follows: teachers guide evaluation, and students show results and evaluate and reflect. The teaching process design of English microcourse in high school is shown in Figure 2.

The main tasks of teachers in the precourse stage are microlesson production, designing learning task lists, and supervising learning. The microlesson video production goes through four stages: integrated teaching analysis, teaching session design, microlesson script design, and microlesson recording and optimization processing, based on the analysis of teaching content, learner characteristics, teaching objectives, teaching sessions, etc., developing course content, determining teaching priorities, collecting various kinds of material resources, organizing teaching content, and producing microlessons according to microlesson scripts. Secondly, we develop a precourse independent learning task list. The task list should be designed to meet the requirements of clear objectives, stimulate interest, be challenging, and relate to classroom learning. In the preclass period, students learn the microlesson, complete the tasks in the task list, and record any search during the preclass period. Microlearning is the key to complete the knowledge transfer. In the microlearning session, students need to browse the learning task list to clarify the learning objectives and tasks and learn with the objectives and tasks. Through the detailed analysis of the system business and the grasp of the main work of this paper, from the perspective of system users, the functions of the social network big data analysis system are mainly divided into data collection and fusion, information retrieval, data analysis, and visualization. These functions are related to each other. First, the data of social networks must be collected, and the data can be

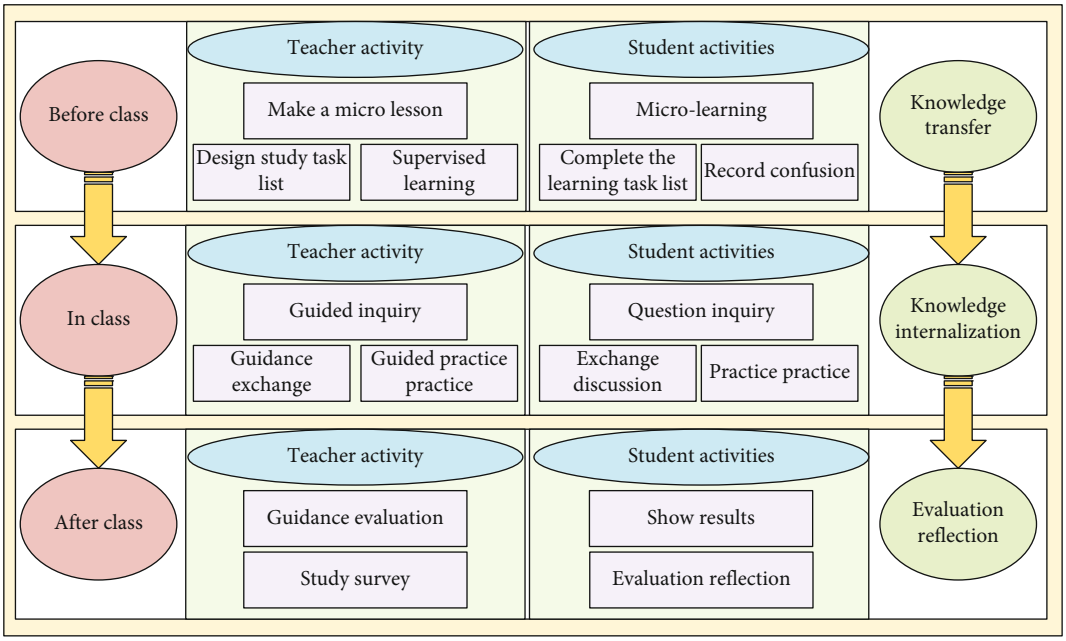

Figure 2: The teaching process design of English microcourse in higher education.

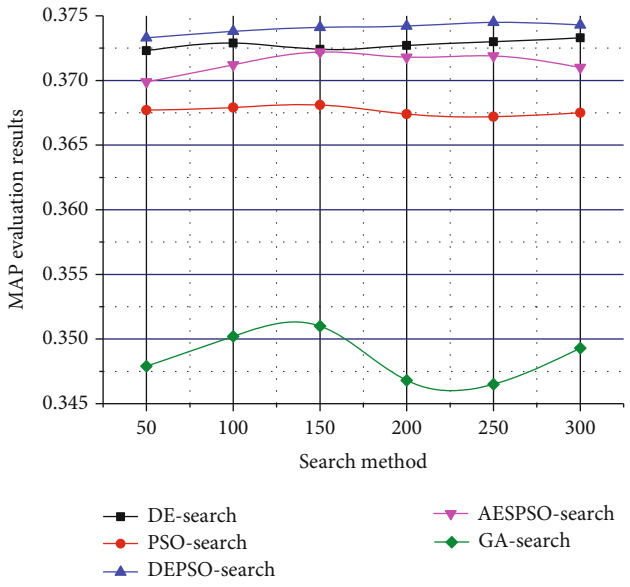

Figure 3: Data retrieval results of data retrieval methods.

preprocessed before information retrieval can be performed. Then, the retrieved data can be mined and analyzed and finally through visualization forms such as graphs, tables, and maps. The results of data analysis are displayed. The following is a detailed description of the functions that the system needs to complete from the perspective of system users, combined with the use of UML use case diagrams.

The main tasks of the teacher in the middle of the lesson are to guide the inquiry, guide the communication, and guide the practice. In the guided inquiry session, the teacher should pay attention to the setting of inquiry questions and focus on developing inquiry skills, guiding students to think independently, solve problems, and construct and improve the knowledge system on their own; in the guided communication session, the teacher should patrol around and give personalized guidance according to students' needs, keep track of students' activities, and make timely guidance and decisions to prevent the inquiry from deviating from the teaching content [19, 20]. Guided practice session sets different levels of tasks for practice, taking into account the level differences between students, and the tasks should be higher than the content of precourse learning and need to integrate the previous learning to complete, to achieve the consolidation of knowledge and flexible use, to achieve theoretical guidance for practice, and to develop problem-solving skills. Students' tasks are mainly problem inquiry, communication and discussion, and practice. The problem inquiry is aimed at completing the mastery of basic theory; the communication and discussion are aimed at opening up the thinking and pooling the ideas for the inquiry problem; and the practice is aimed at applying the knowledge learned to solve practical problems. In the inquiry session, we mainly focus on the problems recorded in the preclass study, the problems that appeared in the assignment test, and the problems set by the teacher in class. After the investigation, the students will exchange and discuss the results of the investigation, gaining different opinions from their peers, and brainstorming, as well as checking their basic theories to fill in the gaps.

Evaluation reflection is not only a means of testing teaching effectiveness but also an important measure of regulation and motivation and can be conducted during or after class depending on the classroom situation. Before evaluation, the evaluation criteria are determined in advance to reduce the negative influence of evaluators' subjective factors on the

evaluation results. Secondly, the principle of diversity of evaluation methods and diversification of evaluation subjects is followed. The diversity of methods takes the form of the diagnostic evaluation, formative evaluation, and summative evaluation, and the diversity of subjects takes the form of self-evaluation, peer or group evaluation, and teacher evaluation, to improve the objectivity of evaluation and students' participation. In the postlesson stage, students are required to present the results of their inquiry and practical exercises and to reflect on them according to the evaluation. In the presentation session, students explain their results and reflect on the strengths and weaknesses of their learning based on teacher evaluation, group evaluation, and self-evaluation, to build on their strengths and make up for their weaknesses in subsequent learning.

4. Analysis of Results

4.1. Retrieval Algorithm Analysis. Among the data retrieval results with MAP as the evaluation metric, only DE-Search, PSO-Search, AESPSO-Search, and PSODE-Search outperformed the performance of the best member system and outperformed the traditional data retrieval methods CombSUM and CombMNZ. Among these four data retrieval methods, PSODE-Search and DE-Search have the best performance, and PSODE-Search achieves the best result at 200 iterations, while AESPSO-Search has the second-best performance. Among the five data retrieval methods that require cyclic operations, PSODE-Search is significantly affected by the number of iterations, and the performance gradually improves with the increase of iterations, while PSO-Search and GA-Search are less affected by the number of iterations. Overall, under the MAP evaluation index, the data retrieval method based on the intelligent optimization algorithm has a certain performance improvement with the increase of the number of iterations, and the experimental results are shown in Figure 3.

As shown in Figure 4, among the data retrieval results with RP as the evaluation metric, only DE-Search, AESPSO-Search, and PSODE-Search outperform the performance of the best member system, and these three have similar performance under the RP evaluation metric, among which PSODE-Search has a better performance and achieves the optimal solution at 100. The optimal solution is achieved at 100 iterations. Among the five data retrieval methods based on intelligent optimization algorithms, GA-Search has the worst performance but outperforms the traditional data retrieval methods CombMNZ and MR-Search. Among the five data retrieval algorithms that require iterative operations, DE-Search and PSODE-Search have a small improvement in data retrieval performance as the number of iterations increases. Overall, the number of iterations has a certain impact on the performance improvement of data retrieval methods based on intelligent optimization algorithms under the RP evaluation index, but the effect is not very significant.

Figure 5 gives the time consumption of each of the eight data retrieval methods in the training and data retrieval phases. From what is introduced in Section 2 of this paper, it can be seen that the linear combination method requires training data to obtain the weights before data retrieval,

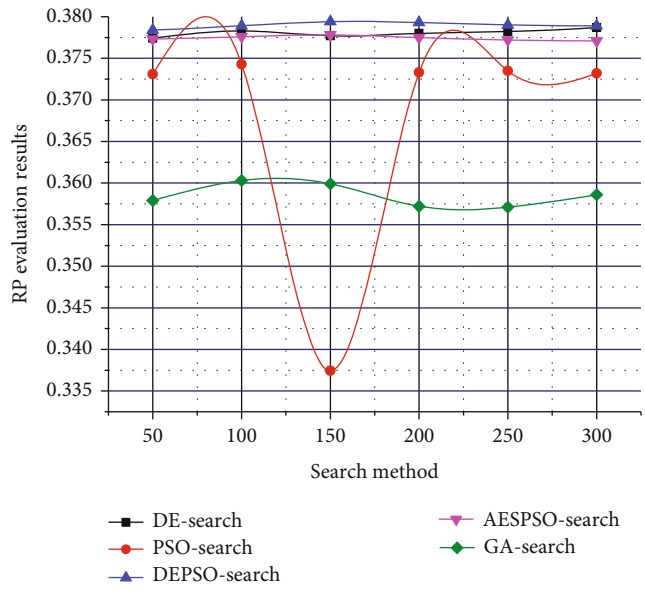

Figure 4: Data retrieval results of data retrieval methods.

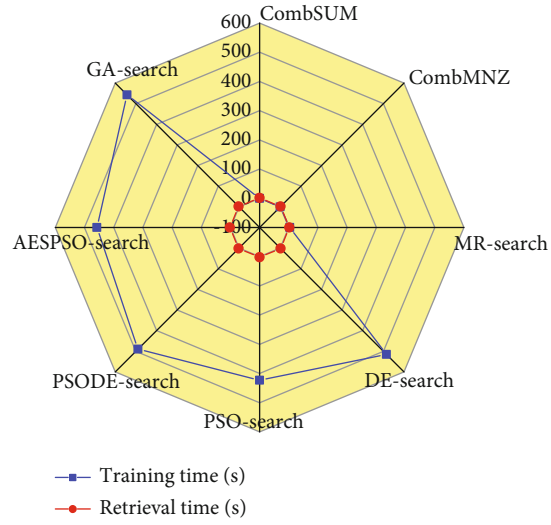

Figure 5: Time is taken by the data retrieval algorithm.

while the CombSUM and CombMNZ methods do not require training weights, so there is no time consumed for training, so the total time consumed by these two methods in the whole data retrieval process is also the least. From the table, it can be seen that the eight data retrieval methods consume approximately the same amount of time in the data retrieval process. Among the six methods that require training weights, MR-Search takes the shortest time. Among the 5 data retrieval methods based on intelligent optimization algorithms, PSO-Search requires the shortest time for training weights, while PSODE-Search consumes less time for training weights than DE-Search but more time than PSO-Search because PSODE-Search alternates between the two methods with a certain probability. Among all the data retrieval methods, GA-Search takes the longest time because

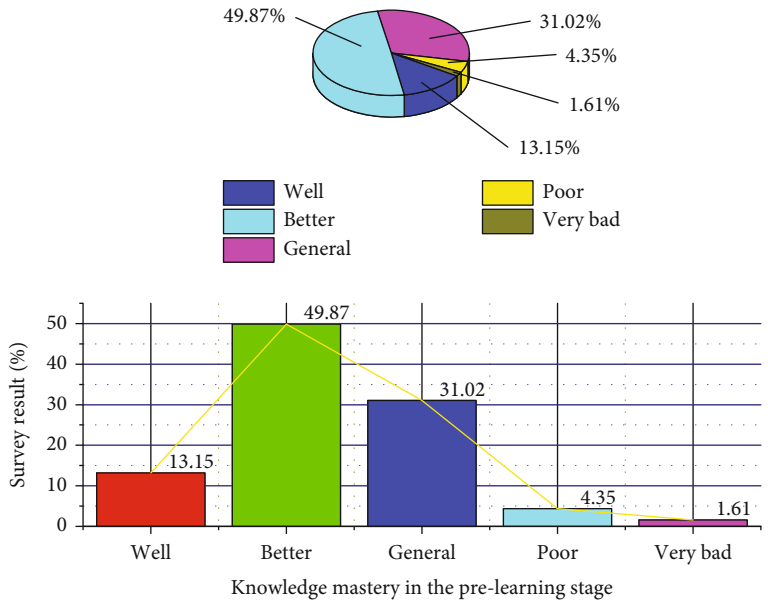

Figure 6: The level of students' precourse knowledge.

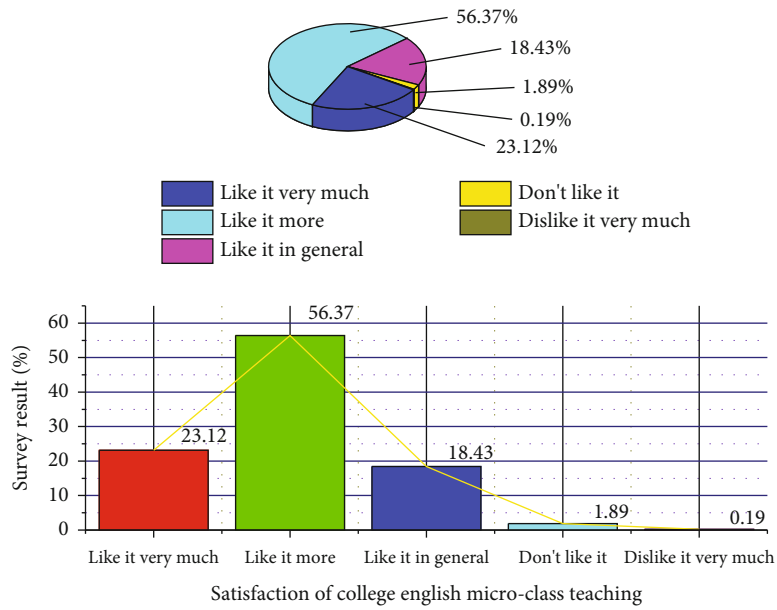

Figure 7: Students' satisfaction with English microlearning in colleges and universities.

the gene sequences of GA-Search population individuals are binary encoded, and the optimization requires the use of trigonometric functions to convert the binary encoding into real numbers for the calculation of fitness values, so it takes a longer time.

4.2. Analysis of Search Results. To have a more objective and comprehensive understanding of students' learning, this paper again used a questionnaire to investigate the influence of English microlearning in colleges and universities on students' learning in terms of their precourse knowledge mastery, classroom learning effects, and general opinions of English microlearning in colleges and universities. Students in the experimental class were surveyed in terms of their knowledge mastery in the precourse learning stage, from "well," "better," "general," "poor," and "very bad." The degree of students' precourse knowledge mastery is shown in Figure 6. According to Figure 6, it can be seen that in the precourse independent learning stage of English microcourse teaching in colleges and universities, most students can master the learned knowledge and skills well by using the class videos, such as pausing or watching them repeatedly. At the same time, students also

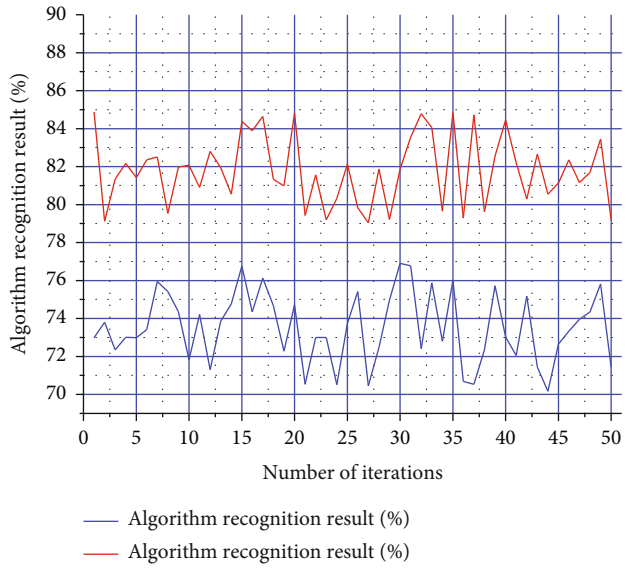

Figure 8: Algorithm recognition correct rate.

reflected that they hoped teachers could upload and share the microlessons with students one or two days in advance. About 6% of students have poor or very poor mastery of basic knowledge and skills in the independent learning stage. Through communication with these students, we learned that microlearning is perfunctory because there is no teacher on-site supervision. For these students, teachers should guide students to change their minds and let them know that we are about to enter a learning society and independent learning is an inevitable trend of development.

The satisfaction survey of English microlearning in colleges and universities was conducted in five degrees: "like it very much," "like it more," "like it in general," "don't like it," and "dislike it very much." "The results of students' satisfaction with college English microcourse teaching are shown in Figure 7. According to Figure 7, 79.49% of the students like English microlearning in colleges and universities. They think that they can watch the microlearning video repeatedly before class and master the basic knowledge in-depth, and they have more time for investigation and practice in class, so they can consolidate and improve what they have learned in a relaxed atmosphere, and at the same time, they can exchange ideas with their peers and groups to pool their ideas and deepen the friendship among students.

The PCHA algorithm proposed in this paper is a hybrid parallel classification algorithm designed to adapt to the massive data classification model MapReduce, and the neighbouring algorithm data retrieval design, combining the advantages of both to improve the traditional serial algorithm classification recognition degree is low, computationally intensive, and time-consuming shortcomings; the experiment uses different sizes of data to test the feasibility of the algorithm according to the amount of data. The comparison statistics of classification recognition degree through the Hadoop cluster to achieve multinode parallel operation are shown in Figure 8, from which it is known that the traditional serial algorithm has a low recognition degree, while the PCHA algorithm has a better recognition degree than the serial algorithm.

The microlesson teaching mode combines the process of input and output. By strengthening the training of students' vocabulary, phrases, and sentence structure, the teacher finds a suitable point to improve students' reading level and designs reading tasks according to students' level. I found that after a period of experimental teaching of microlessons, students not only improved their interest in reading but also mastered the methods and skills of reading, and their reading level was greatly improved. For teachers, the effective preview of students saves class time and provides a guarantee for teachers to expand their knowledge. At the same time, we must also see that there are some problems in the application of microclasses to teaching. First of all, the production equipment and technical support of microclasses are a major problem in the application of microclass teaching, and they are also the basic conditions for microclass teaching. Secondly, students have requirements for self-control and self-learning ability when using microclasses. Students also have high requirements for microclasses. Not all students are the audience of microclasses, and application of microclass learning requires a transitional period for teachers and students. They want to form a complete and systematic microclass teaching mode. It also requires continuous practice and exploration by educators.

5. Conclusion

In this paper, the weight assignment strategies based on differential evolution algorithm and particle swarm algorithm are discussed. Based on the above two optimization algorithms, the adaptive alternating particle swarm differential evolutionary optimization algorithm-based weight assignment strategy is explored, where the adaptive alternating particle swarm differential evolutionary optimization algorithm is invoked for the first time for data retrieval. The effectiveness of the above three weight assignment strategies is tested. The performance of the three data retrieval methods explored in this paper is compared using TREC data, controlling for the number of member systems involved in data retrieval and the number of iterations of the algorithms, using different evaluation metrics. The experimental results show that the performance improvement of the data retrieval results obtained by the weight assignment strategies based on the differential evolution algorithm and the particle swarm algorithm is more obvious, while the improvement of the data retrieval results obtained by the weight assignment strategy based on the adaptive alternating differential evolution particle swarm optimization algorithm is the most obvious. It was verified that the combination of microlearning and English microlearning in college is an effective strategy to improve the learning effect of algorithm and programming; it was tested that the microlearning-based English microlearning in college is beneficial to stimulate students' interest in learning. Microlesson teaching is conducive to stimulating students' interest in learning and cultivating students' ability of independent learning, thinking, and cooperative inquiry; it provides some reference and suggestions for future front-line teachers to implement microlesson teaching of English in colleges and universities. We hope that we can

continue our research in the future and contribute our efforts to the education of IT subjects to be worthy of ourselves and our students.

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 is no conflict of interest.

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