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Research Article

Artificial Intelligence Evaluation for Mathematics Teaching in Colleges under the Guidance of Wireless Network

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Comprehensively improving the quality of teaching is the highlight of current higher education. Also, it meets the basic needs of China's current transformation into a country for strong education. Mathematics is one of the most important subjects in education these days, which is widely applied in research, social life, and understanding various science theories and laws. Hence, improving the quality of teaching mathematics in colleges becomes an important task in modern college teaching. In particular, the wireless integration of information has enriched and diversified the teaching methods of higher education. Vigorously promoting the application of wireless network technology in mathematics teaching is not only an effective way to solve the insufficient supply of educational resources but also a bold attempt to innovate the mathematics teaching mode in colleges and universities. Firstly, this work proposes an IACO-BP (improved ant colony optimization-based backpropagation) network to evaluate teaching quality for higher level mathematics in a wireless network environment. It improves the traditional ant colony optimization algorithm from three aspects, namely ant colony pheromone adaptive volatility coefficient, pheromone iterative elite selection strategy, and population iteration, adding a variation factor to construct IACO. Then, we use IACO to optimize initial weight and threshold to solve the issue of BP network's falling into local optimum and improve network performance. Secondly, this work puts forward a series of countermeasures for the construction of mathematics teaching system in colleges. The correctness and superiority of the proposed strategy are verified by comparing the mathematics teaching quality in colleges before and after using the proposed strategies. Various aspects of mathematics teaching, such as teaching objectives, teaching content, and teaching process, are evaluated before and after using these strategies. These features are improved by a significant margin, up to 2.6%, after applying the proposed strategies.

1. Introduction

Science and education are the means by which a nation could be revitalized, and the 21ˢᵗ century's competition is a contest of economic might and science and technology. In the end, it is all about the competition of skills, and education is the key to cultivating those talents. Hightech is the key factor to maintain the comprehensive strength and competitiveness of a country. Hightech is essentially a mathematical technology, and the knowledge-based economy is marked by the successful use of mathematics. Therefore, strengthening mathematics education is important for implementing science and education to rejuvenate a country. At present, in addition to its own continuous improvement and development, mathematics also penetrates into other fields and combines with other disciplines to form many marginal disciplines. Therefore, mathematics not only plays a big role in the development of science and technology but also has an irreplaceable role in economic science, environmental science, social science, and even humanities [1–5].

Judging the current mathematics teaching system in colleges, there are relatively prominent issues, which can be summed up in two aspects. Firstly, students do not have a good attitude toward learning mathematics. Because of the deep influence of the current society, students are more inclined to more practical subjects while choosing major subjects. Many of mathematics students at the earlier stages think it has little to do with practical problems. Hence, it is difficult for them to establish a correct learning attitude.

Because there is no good learning attitude as the foundation, some problems have arisen in the development of mathematics teaching. Secondly, in mathematics teaching activities, because of the slow update speed of teaching content and teaching methods, students are prone to fatigue in the process of receiving knowledge, and this fatigue will lead to a further decline in students' interest. In the process of learning, interest and passion play an important role. Low interest and insufficient passion will result in low learning efficiency when comprehensively reflected in mathematics learning. There are two main issues. Firstly, from the perspective of curriculum setting and selection of teaching materials, the classification of mathematics teaching in colleges is not detailed enough, and there are situations where the focus is unclear in specific learning and research. The school's setting of mathematics courses is mainly based on theoretical teaching. Even in the teaching of applied mathematics, the practical curriculum setting is obviously too small, which leads to the inability to carry out mathematics practice effectively [6–10]. In terms of the selection of teaching materials and content of the course, the timely update is insufficient, which makes the teaching content lag. Secondly, in terms of the construction of the teaching team, as the school does not consider the construction of the teaching team, the teaching level of the teachers in the team is uneven. The management problems existing in the mathematics teaching system also influence the teaching quality. Firstly, the teaching sequence is unreasonable. The teaching of mathematics was originally a step-by-step process. However, in the actual teaching process, to complete some teachers' teaching courses, the teaching sequence is often confused, which affects its continuity and breaks the students' learning rules. Secondly, there are unreasonable situations in the arrangement of courses and class hours. In actual mathematics teaching, there should be a certain proportion of theoretical class hours and practical class hours, and their arrangements should be relevant. However, in the current teaching, not only the proportion is chaotic but also the correlation setting is broken, resulting in the chaos of the management of the whole teaching system [11–15].

The wireless integration of information has enriched and diversified the teaching methods of higher education. The combination of wireless network and mathematics teaching has the following advantages: firstly, it has high mobility and flexible teaching time and space. The wireless network has the characteristics of three-dimensional coverage and high mobility. Users can collect and process information at any location and at any time covered by the network. High mobility provides great convenience for education and teaching. Students can easily and quickly collect and utilize information in places with wireless network coverage, such as school teaching buildings and libraries. Teaching and learning are more flexible in time and space. Secondly, the operating cost is low, and the allocation of teaching resources is reasonable and effective. Wireless networks can reduce the need for wiring and related expenses, have a short construction period, and are simple and convenient to upgrade and retrofit with low costs. Colleges and universities vigorously promote the construction of wireless networks, which can reasonably allocate and effectively utilize teaching resources. Thirdly, it is easy to expand and adapt to teaching needs. A wireless network can be competent from a small local area network with only a few users to a large network with thousands of users, and it is easy to expand. Students can make full use of the network signal in the area covered by the wireless network to concentrate or disperse study and discussion. It can effectively alleviate the problems that cannot be solved by the traditional wired network in the construction of the campus network and make up for the insufficiency of the wired network [16–20].

Our work proposes an IACO-BP network to evaluate the teaching quality of mathematics and suggest a number of countermeasures to improve it. The main contributions of our work include the following:

We discuss the importance of and the research status regarding mathematics teaching at college level in detail. Then, we introduce the improved ant colony optimization (IACO) algorithm and propose an IACO-BP network to evaluate the teaching quality in a wireless network environment. The traditional ACO (ant colony optimization) algorithm is improved in a number of ways by introducing pheromone adaptive volatility coefficient (PAVC), pheromones update elite selection (PUES), and population variation factor (PVF) strategies. The IACO algorithm is used to optimize the BP network so that it does not fall into a local optimum. A number of countermeasures are introduced to improve the quality of mathematics teaching, and a number of data features, such as teaching contents and teaching method, are defined to assess the effectiveness of the proposed methodology.

2. Related Work

Gong and Liu [21] analyzed the perspectives, abilities, and experiences of different evaluation subjects and expounded the advantages and disadvantages of each subject in teachers' classroom teaching evaluation. It suggests that colleges and universities should reasonably select the evaluation subject for different evaluation purposes and establish and improve the operation mechanism to improve the effectiveness of teaching evaluation work. Onwuegbuzie et al. [22] pointed out that in the game evolution of the interest demands of stakeholders in evaluation system, the main subjects of evaluation are teachers, students, and teaching administrators. It uses the stakeholder theory as an analytical framework to explain and reveal the problems and related reasons of the student evaluation system. It believes that the participation of stakeholders in the governance model can reflect the governance attributes of the teaching evaluation system and can also express the teaching character that the system should uphold. Spooren et al. [23] clarified the actual role of each evaluation subject in teaching evaluation by empirically analyzing the reality of multisubject teaching evaluation in colleges and difference mechanism of teaching evaluation subject evaluation. It reveals the existing problems and summarizes the characteristics and differences of each subject in the teacher's teaching evaluation. It puts

forward the suggestion of establishing a developmental multisubject teaching evaluation system, and then, it stimulates the internal force of the reform of the teacher evaluation system in colleges. Tsao and Lin [24] proposed that there were many issues, such as backward ideological concept, extensive organization and management, and the dislocation of system orientation in the current colleges and universities, to carry out students' teaching evaluation work. Based on the student-centered concept, it scientifically develops a student evaluation index system, comprehensively improves the management of evaluation organizations, and optimizes the student evaluation system. Bianchini et al. [25] and Boysen et al. [26] use AHP to establish the hierarchical relationship of the evaluation index system for classroom teaching quality. On the basis of hierarchical relationship and weight vector, a more comprehensive evaluation model is established by the fuzzy comprehensive evaluation method for student evaluation, peer teacher evaluation, expert evaluation, and teacher self-evaluation systems.

The analytic hierarchy approach was utilized to calculate the weight of each index, and the fuzzy method was employed to conduct a full evaluation [27]. Finally, the scientificity and operability of the evaluation method are verified by examples. Wines and Lau [28] introduced the cloud model into the field of uncertain linguistic multicriteria decision-making, and the qualitative and quantitative transformation of knowledge and the aggregation of linguistic values were carried out. It establishes a multicriteria group decision-making for uncertain language teaching quality evaluation model for college teachers and builds an evaluation index system based on questionnaire survey and analytic hierarchy process. Smith [29] draws on the student evaluation questionnaire of a certain university and uses the AHP to process and establish the structure of the student evaluation system. A quantitative analysis model based on fuzzy mathematics for students' evaluation of teaching is given. The model is practical and effective, easy to apply, and easy to implement on the computer. Uttl et al. [30] employed the grey system theory technique and created a matching evaluation model with the output of college and university teaching quality. Based on the data from university teachers' evaluations, it also conducts empirical analysis. The empirical data shows that it has good effect, high precision, and wide applicability. Hassad [31] draws on the fourth-generation evaluation theory and total quality management theory to sort out the two-core content of quality assurance in management and evaluation. It puts forward the concept of student-centered teaching quality assurance. According to this concept construction, three characteristics of student-centered teaching quality assurance are obtained. Then, put forward the teaching quality assurance and improvement strategies, such as organizational strategy, goal construction strategy, service support strategy, and evaluation feedback strategy.

Our work contributes to the existing research and puts forward some important countermeasures for the betterment of mathematics teaching at college level. We collect data about the various aspects of mathematics teaching, including teaching method, teaching process, teaching attitude, contents etc., and use the state-of-the-art artificial intelligence algorithm and assess the performance of the proposed approach. We use the improved ant colony optimization algorithm and propose an IACO-BP network to evaluate the teaching quality in a wireless network environment. The traditional ant colony optimization algorithm is improved by introducing a number of strategies to enhance the performance of the deep learning algorithm.

3. Method

Firstly, this work proposes an IACO-BP network to evaluate teaching quality of higher mathematics in a wireless network environment. The traditional ant colony optimization algorithm is improved in the following three aspects: ant colony pheromone adaptive volatility coefficient, pheromone iterative elite selection strategy, and population iteration adding variation factor to construct IACO. The initial weight and threshold of the BP network can be optimized using IACO to avoid the problem of the BP network falling into a local optimum, and hence, the network performance is enhanced. It also proposes a number of solutions to the problem of math education at colleges and universities. The proposed technique's correctness and superiority are demonstrated through a comparison of the quality of mathematics instruction in universities and colleges before and after the implementation of the strategy.

3.1. Backpropagation Algorithm. BP network is a feedforward network, which can use error backpropagation to train its own network. First, there is the the input layer, followed by a hidden layer or many hidden layers, and finally, there is a third-layer output. BP networks typically have a three-layer structure. As long as the number of nodes in the hidden layer is sufficient, the 3-layer BP network may simulate arbitrary complicated nonlinear mappings. The BP structure is demonstrated in Figure 1.

When information from the outside world enters the input layer and is then sent to the next layer, there is no link between any two neurons in that layer. Only the input and output layers can link to the hidden layer, which is located between the input and output layers. Each neuron node can only receive information from the previous layer's input layer and pass it on to the following layer's output layer. Despite the fact that information travels in a forward direction, the weightings and thresholds that connect the various levels might have an impact on the relationship between the input and output. When the hidden layer receives an error, the output layer accepts it and returns it to the previous layer [32, 33].

Supervised learning and unsupervised learning are the two main types of learning algorithms. A set of training sets are sent into the network, and the connection weights are modified based on the difference between the network's actual output and its anticipated output. From the input layer, the neuron is triggered and the neuron activation value propagates through each intermediate layer to the output layer, where the network's final output result can be
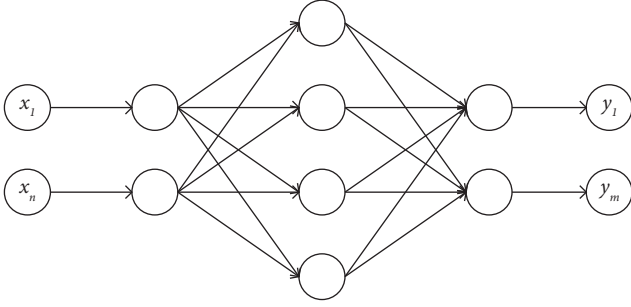
FIGURE 1: BP structure.

obtained. As a result, each connection weight is rectified layer by layer through each intermediate layer to reduce the mean square error between the expected output and the network output. The error signal can be reduced to a level near to the objective if the process of study and adjustment is repeated over and over. Network training is terminated and data is analyzed using the least mean square error research approach. The output, loss, and reverse update strategy of the BP network are as follows:

$$y_i = f\left(\sum_{i=1}^{N} w_i x_i + b_i\right), Loss = \sum_{i=1}^{N} (y_i - o_i)^2, w' = w - \Delta w, b' = b - \Delta b. \tag{1}$$

There are a number of advantages to backpropagation networks. The first is nonlinearity. When the neurons of the neural network are all nonlinear neurons, the neural network at this time also belongs to the nonlinear neural network. For these nonlinear neurons, the BP network still has a strong mapping ability. The second is the mapping function. After the research and training of the network, the BP network can map the input neuron nodes to the output neuron nodes, which can solve various linear and nonlinear problems well. The third is strong research ability. In the process of neural network training, it can continuously adjust and change the weights and thresholds, so as to continuously study the data in the neural network and get the law between the data to improve the correctness of the neural network.

The BP network also has some disadvantages. The first is that it is easy to get stuck in local minima. The BP network adopts the gradient descent method, and the training process is constantly changing from one point along a slope, and gradually, it tends to the minimum error. The more complex the network, the more its error function will resemble a surface in a multidimensional space, which has a minimum point. Since the surface of the multidimensional space is uneven, when the neural network is trained, it is possible to find a local optimum. The second is the slow convergence rate of the algorithm. The BP network uses the gradient descent method to correct the connection weights, and the calculation process of the gradient descent method is very complicated. With the continuous training of the network, the error that can be reduced by each training in the later stage becomes smaller and smaller. To achieve the predetermined error range, the number of training times of the

network will inevitably increase [34]. The BP network can be combined with other algorithms for optimization and improvement, and the ACO algorithm optimizes the prediction model of the BP network to improve the convergence speed of the traditional BP network prediction model, and it can achieve high accuracy. Therefore, in data prediction, the combination of the ACO algorithm and BP network has great advantages [35, 36].

3.2. ACO Algorithm. The ant colony algorithm is inspired by the foraging behavior of ants. To find food, the ants randomly search the area around the nest initially. When they find a food source, if the food is too big, they take part of it and leave a chemical smell as a marker along the way. After a period of transportation, it can be found that the transportation path is getting shorter and shorter, and slowly, this path becomes the shortest path between the ant colony's nest and the food source. When other changes occur in the path, the ants quickly adjust to find the new shortest path. The chemical smell is called a pheromone, which gives the ants a direction, however, the pheromone will slowly evaporate over time. Ants perceive this odor in the environment, and the odor stimulates the ant to respond and subsequently produce new odorants themselves. The new odorant produced guides other individuals in the entire population. Communication and cooperation are carried out through this direct or indirect communication method. This collaborative approach has two notable features. Each individual can modify existing odorants according to environmental conditions by releasing new odorants, and the odorants can only be perceived by individuals with peripheral access.

During the foraging process, when there is no pheromone around the ant or the surrounding pheromone concentration is the same, the direction chosen by the ant is random. When the pheromone concentrations around the ants are different, the ants tend to move forward in the direction of stronger concentration. Ants have poor eyesight and simple behavior, while colonies can find the shortest path between their nest and food in complex terrain. When there is no obstacle between the ant's nest and the food source, the path found by the ants is often close to a straight line, and there will be no curved and redundant routes, which is convenient for the ants to carry the food with the highest efficiency. When obstacles are added to the transport route, if the length of the obstacles is the same length on both sides of the path, the ants will randomly search on both sides of the obstacles. After a period of searching, if the number of ants on both sides is roughly the same, the ants will eventually randomly select a path. If the number of ants on both sides shows a significant difference, the ants will tend to take the path with more ants and higher pheromone content. If the length of the obstacle is not equal on both sides of the path, the ants will choose the path at both ends of the obstacle with equal probability at first. After a period of searching, with the positive feedback mechanism of the ant colony, the longer path takes longer, and the pheromone is more volatilized and less retained. With the passage of time,

pheromone accumulates continuously, increasing the possibility of ants choosing shorter paths. The number of ants on both sides will show a significant difference, and eventually, the ant colony will choose the shortest path to carry food [37].

The core of the ant colony algorithm in path search is mainly reflected in the state probability transition and pheromone update during path selection.

$$p_{ij}^k = \frac{[\tau_{ij}]^\alpha [\eta_{ij}]^\beta}{\sum [\tau_{is}]^\alpha [\eta_{is}]^\beta}. \tag{2}$$

Over time, as the number of ants increases, the residual pheromones continue to accumulate, resulting in the ineffectiveness of heuristic information. When the ants complete a path optimization, they need to update the pheromone in time.

$$\tau_{ij}(t+n) = (1-\rho)\tau_{ij}(t) + \Delta\tau_{ij}(t). \tag{3}$$

3.3. IACO-BP Algorithm.

The ant colony algorithm has good global optimization ability, and considering that the BP network is prone to fall into extreme values during training, the ACO and BP network are integrated, and the global optimization ability is used to overcome the defects. Pheromone is significant in the process of finding solutions in the ant colony algorithm. The pheromone volatilization coefficient of the ant colony algorithm is constant, however, the volatilization speed is different in the early stage and the later stage [38–41]. Hence, this paper adopts the pheromone adaptive volatilization parameter to replace the fixed value. Every time the ant population is updating the pheromone, the elite retention strategy is adopted, the individuals that meet the standard are retained, and those who do not meet the requirements are not directly discarded. Moreover, this work adds a variation factor and reiterates the cycle.

Firstly, IACO uses a pheromone adaptive volatility coefficient (PAVC) strategy. In the process of using the ant colony algorithm to construct the solution, the idea of constructing the adaptive volatility coefficient is used to determine the weight threshold of the BP neural network. An initial value is given during initialization, and the fixed value is no longer used in subsequent iterations, however, adaptive changes are made at each update iteration.

$$\rho = \rho_{start} * \left(1 - \frac{T}{T_{max}}\right). \tag{4}$$

If the volatility coefficient is too large, it may directly lead to the appearance of oscillation. If the volatility coefficient is too small, the convergence speed is relatively slow. Hence, an adaptive volatility coefficient is used. In the early stage, the convergence ability can be enhanced, and the larger the volatility coefficient in the later stage, the more the oscillation phenomenon can be avoided.

Secondly, IACO uses pheromones update elite selection (PUES) strategies. When the global pheromone is updated, the population needs to be selected according to the demand, and the individual fitness of the ant colony is judged as the pheromone concentration. If the fitness is greater than the average, the update iteration is continued. For the part smaller than the average value, a variation factor is added to make the new population join the loop, and the iterative optimization continues. The formula for judging fitness is as follows:

$$fitness = \begin{cases} \alpha * fitness, & fitness < P, \\ fitness, & fitness \geq P. \end{cases} \tag{5}$$

Using the elite selection strategy can make the ant system quickly find the optimal solution. If the number of ants is too large, the search will quickly gather near the optimal value, resulting in the premature convergence of the search. Therefore, choosing an appropriate number of elite ants is beneficial to avoid the algorithm falling into extreme values during iteration.

Thirdly, IACO uses a population variation factor (PVF) strategy. For the population with poor calculation results, adding a variation factor to increase the diversity of variables provides more possibilities for finding solutions later.

$$\alpha = 5 * Rand(0, 1). \tag{6}$$

When the ant colony algorithm iterates to the later stage, it is easy to fall into the local extreme value. The main purpose for adding the variation factor is increasing the diversity and provide more possibilities for finding solutions.

The IACO-BP algorithm can be optimized using the IACO algorithm's approach of optimizing the parameters of the BP algorithm. Once IACO has optimized the weights and threshold values, the search for better solutions can begin. The BP algorithm then goes through the process of learning and training under the influence of the optimal value. Its corresponding program flow is demonstrated in Figure 2.

3.4. Countermeasures for Constructing the Mathematics Teaching System.

Aiming at the mathematics teaching in colleges under a wireless network environment, this work proposes some countermeasures to construct the mathematics teaching system in colleges.

Firstly, rationally guide and change students' attitudes. In constructing the mathematics teaching system in colleges, it is very important to guide students reasonably to change their learning attitudes. Changing students' attitudes needs to be done from two aspects. First of all, educate and cultivate the importance of mathematics to students. Secondly, in the normal classroom teaching, we should use more examples of solving practical problems with mathematics to analyze and explain, so that students can understand the practical value of mathematics to realize the practical significance of mathematics.

Secondly, make use of the students' subjective nature to pique their interest in studying. Students are the major body of learning in teaching. Hence, it is vital to encourage the main body to exert its force. In teaching, teachers should
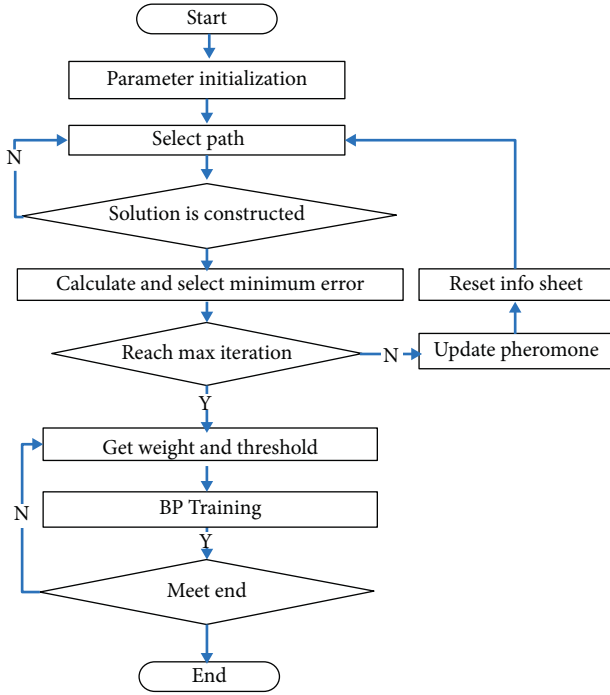
Figure 2: IACO-BP pipeline.

actively reform teaching methods, such as using inquiry-based teaching, multimedia teaching, etc., to encourage students to become the leader of the classroom, and to conduct in-depth discussions on topics to promote understanding of teaching knowledge. Using this method, students' enthusiasm for learning is stimulated, and the classroom atmosphere will also change. In a good atmosphere, the teaching effect will be greatly improved.

Thirdly, improve overall quality of teachers. It is necessary to strengthen the teaching ability of teachers. The strengthening of teaching ability mainly includes professional knowledge reserve, classroom atmosphere mobilization, and classroom on-site control. The reserve of professional knowledge is to lay a solid foundation for a high quality of teaching, and the mobilization and control of classroom atmosphere is mainly to create a good teaching environment. Through the cultivation of scientific research and innovation ability, teachers' research ability can be improved to strengthen the ability to answer students' questions.

Fourth, build a quality assurance system for mathematics practice teaching. In the mathematics teaching system, practicing teaching occupies an important position. Hence, the quality of practice teaching must be guaranteed in teaching. The guarantee of practical teaching quality needs to start with the construction of a complete system, and this system mainly includes three aspects. First of all, it is necessary to establish a perfect research system, i.e., there must be clear requirements for the raising of questions, the collection of data, and the research. Secondly, establish the standardization of the research process. In the process of problem research, there must be professional guidance for the research strategies and methods of different problems to

achieve standardization. Finally, establish a sound evaluation standard. To realize the evaluation of the quality of teaching practice, it is necessary to carry out standard construction for each project, and the final quality will be reliable.

4. Experiment

4.1. Analysis on IACO-BP. This work collects relevant mathematics teaching data from colleges to construct the dataset required for IACO-BP training and testing. The data feature distribution of each sample is shown in Table 1, and the corresponding label is the quality of mathematics teaching in colleges under wireless network environment. Precision and recall are evaluation metrics.

Firstly, this work analyzes the training loss of the network because the training of the network is the basis for subsequent testing, and the training loss is demonstrated in Figure 3.

The loss of IACO-BP first gradually decreases with the training of the network, and when the number of iterations reaches 60 epochs, the network converges.

IACO-BP uses PAVC to improve ACO. The volatility rate of pheromone trail is one of the main parameters in the ant colony optimization algorithm and is usually set experimentally for the application of the algorithm. It helps to converge the algorithm to the global optimal solution. To verify the effectiveness of this improvement measure, the performances without PAVC and when PAVC are used are compared, as demonstrated in Figure 4.

After using the PAVC strategy, the precision and recall are improved by 1.6% and 1.8%, respectively, which verifies the superiority of the PAVC strategy.

Another strategy used to enhance the performance of the ACO algorithm is the pheromones update elite selection (PUES) strategy, which increases the pheromone on the edges of the shortest path and accelerates the convergence of the algorithm. To verify the effectiveness of this improvement measure, the performances without PUES and when PUES are used are compared, as demonstrated in Figure 5.

After using the PUES strategy, precision and recall are improved by 1.3% and 1.6%, respectively, which verifies the superiority of the PUES strategy.

IACO-BP uses PVF to improve ACO. To verify the effectiveness of this improvement measure, the performances without PVF and when PVF are used are compared, as demonstrated in Figure 6.

After using the PVF strategy, the precision and recall are improved by 1.1% and 1.2%, respectively, which verifies the superiority of the PVF strategy.

4.2. Analysis on Countermeasures for the Mathematics Teaching System. This work puts forward a series of countermeasures for the construction of mathematics teaching system in colleges under the wireless network environment. To verify the effectiveness of these strategies, the quality for mathematics teaching in colleges is compared before and after using these strategies. The comparison

Table 1: The data feature distribution of each sample.

Index	Feature
x_1	Teaching objective
x_2	Teaching content
x_3	Teaching attitude
x_4	Teaching process
x_5	Teaching method
x_6	Coursework
x_7	Student interest
x_8	Test score
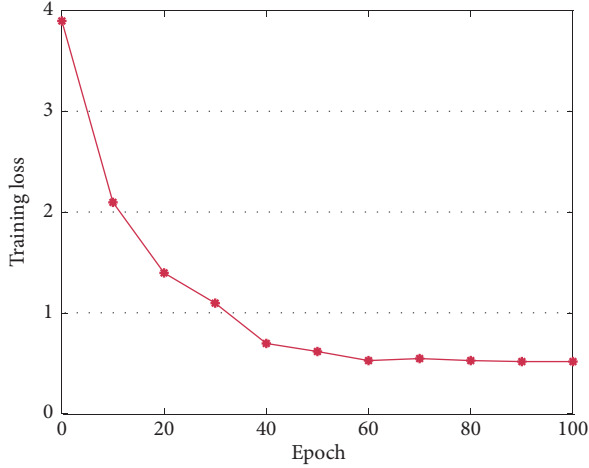
Figure 3: Training loss analysis.

Figure 4: Analysis on PAVC strategy.

Figure 5: Analysis on PUES strategy.

Figure 6: Analysis on PVF strategy.

Table 2: Analysis on countermeasures.

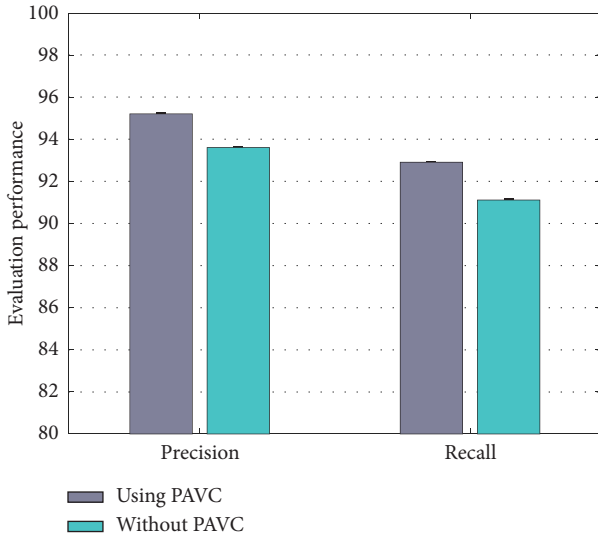| Item	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8
Before	89.2	85.7	91.3	90.7	85.9	88.2	92.5	91.1
After	90.4	86.9	93.5	92.1	88.5	90.1	94.3	91.9

indicators are from Table 1, and the comparison results are demonstrated in Table 2.

As demonstrated in the table, after using the countermeasures proposed in this work to build a mathematics teaching system in colleges, the scores of each teaching quality ind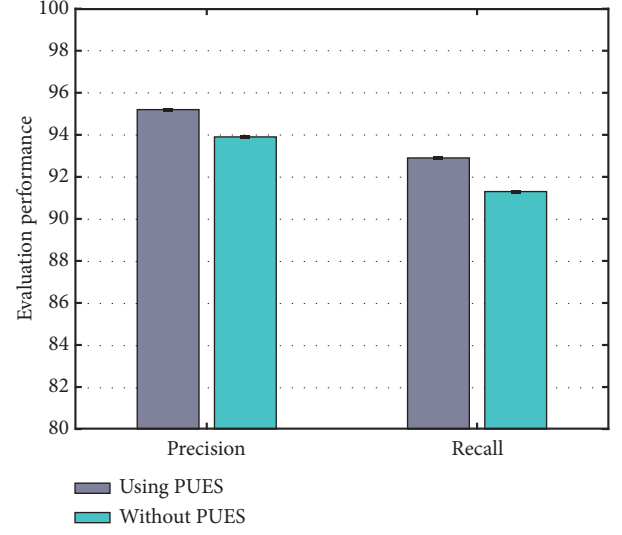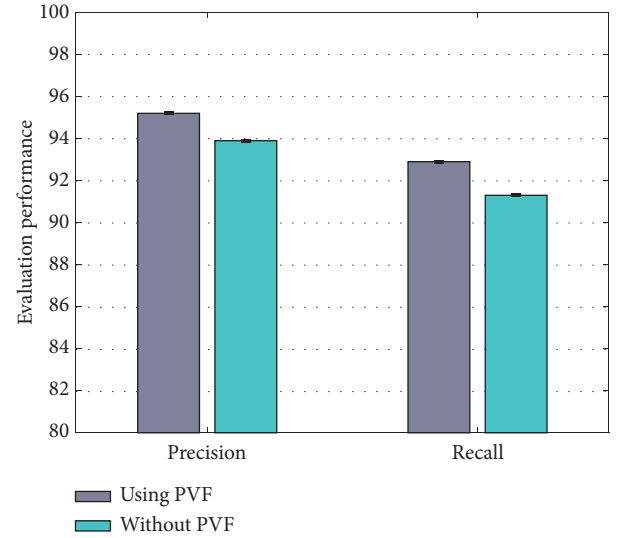ex have been improved significantly. For example, the score of teaching method (x5) has been improved by 2.6% and that of teaching attitude is improved by 2.2%. It verifies the feasibility and the effectiveness of the proposed countermeasures.

5. Conclusion

Mathematics teaching in colleges under a wireless network environment is more extensible, autonomous, and flexible than the traditional method of mathematics teaching. To

realize this new learning environment that is learner-centered, cooperative, continuous, and ubiquitous, in addition to seeking the support of software and hardware conditions, it is more important to pay attention to the transformation of teachers and students' teaching. Only when the concept of teaching and learning is updated with development for wireless network, the function and advantage of wireless network in teaching can be truly reflected. The application of wireless network is a great supplement and improvement to the time, space, and usage of wired network. Under this background, it has become an important subject to effectively evaluate the quality of mathematics teaching in colleges under a wireless network environment. Firstly, this work proposes an IACO-BP network to evaluate the teaching quality of higher mathematics in a wireless network environment. The traditional ant colony optimization algorithm is improved by introducing various strategies, including ant colony pheromone adaptive volatility coefficient, pheromone iterative elite selection strategy, and population iteration adding variation factor, to construct IACO. The backpropagation network is easy to fall into local optimum. This issue is resolved using IACO, which optimizes the initial weight and threshold, thus improving the performance. Secondly, this work puts forward a series of countermeasures for the construction of mathematics teaching system in colleges. We collected the relevant data from a number of colleges and constructed a dataset to assess the performance of our approach. We compared the different aspects of teaching quality before and after using the suggested countermeasures. The results verify the correctness and superiority of the proposed strategy.

Data Availability

The datasets used during the current study are available from the author on reasonable request.

Conflicts of Interest

The author declares that he has no conflicts of interest.

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