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Retraction

Retracted: Study on the Quality Analysis and Improvement of Tennis Teaching under the Internet System

Wireless Communications and Mobile Computing

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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.

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[1] Y. Zhang, "Study on the Quality Analysis and Improvement of Tennis Teaching under the Internet System," *Wireless Communications and Mobile Computing*, vol. 2022, Article ID 7735046, 9 pages, 2022.

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Research Article

Study on the Quality Analysis and Improvement of Tennis Teaching under the Internet System

Yuan Zhang

Physical Education Department Northwest University, Xi'an Shaanxi 710069, China

Correspondence should be addressed to Yuan Zhang; zytennis@nwu.edu.cn

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Improving the quality of tennis teaching and learning is an important part of the modernization of education in China. The limitations of traditional tennis teaching quality evaluation methods have made them controversial, and it is crucial to improve the scientific, rational, and timely evaluation of tenn is teaching quality. Therefore, it is necessary to establish a scientific and rational quality evaluation model for tennis education to evaluate the quality of tennis education. Based on the principle of constructing a perfect tennis teaching quality evaluation system, this paper analyzes the advantages and disadvantages of the previous tennis teaching quality evaluation methods and summarizes the problems existing in the current tennis teaching quality evaluation system in a university. On this basis, to break the limitations of the existing tennis teaching quality evaluation system in a university, a tennis teaching quality evaluation model based on genetic algorithm (GA) and back-propagation (BP) neural network is proposed and a more scientific reasonable tennis teaching quality evaluation system. The evaluation results of BP neural network optimization method based on adaptive mutation genetic algorithm are very satisfactory.

1. Introduction

After the expansion policy of Chinese universities was implemented in 1999, the investment in higher education, the reform of higher education degree system, and the concept of higher education industry, economic growth, and employment growth have made remarkable achievements. At the same time, the decline of the quality of university education has become increasingly prominent [1–3]. Numerous companion policies are designated aiming to make some progress in solving the problems that exist in key areas and weak links that cause negative impact on the actual effect of higher education teaching [4–6]. At the same time, it is necessary to improve the current tennis education quality and education quality evaluation system and build a tennis education quality evaluation system suitable for the actual situation. The position of tennis education itself judges that the evaluation of the quality of education of teachers cannot be evaluated by theoretical education alone, but more attention should be paid to the development of practical skills of students. So that students can not only master comprehensive theoretical knowledge but also have a healthy physique and good hands-on ability [7, 8]. Therefore, assessing the quality of tennis education is an important part of education management. Based on the above understanding, this paper uses intelligent technology to make the assessment of the quality of tennis education more scientific and quantitative. This paper also creates research content for this paper with diagnostic, feedback, and motivational capabilities. This allows you to find problems in the education process and give feedback to teachers in a timely manner, thereby improving and improving the quality of education [9]. In addition, setting up a reasonable evaluation mechanism can stimulate the enthusiasm and initiative of teachers to cultivate talents to a certain extent and can also help improve the quality of teaching to a certain extent.

Tennis has been regarded as a sport by the nobility since its inception in the 12th century. The standard tennis court is 23.77 m long and 10.98 m wide, covering an area of 36.6 m and 18.3 m wide. Due to strict venue requirements, there is a shortage of sports venues. While developing school sports and strengthening the construction of a sports power, formal college tennis education is for the participation of tennis, which can effectively promote tennis and promote tennis to serve the masses.

Citizens can play tennis in their spare time, experience role switching, relieve role stress, improve health, entertain the mind and body, and promote personal and social development. Cultivating a potential social sports population is inseparable from school sports activities. To build a strong country in sports, universities should not only improve the level of education and improve the physical fitness of students but also combine sports and education to provide a good foundation for mass sports and competitive sports, which needs to be done well. On the other hand, the effective development of tennis education can actively promote the tennis atmosphere in ordinary colleges and universities, lay a solid foundation for tennis audiences, and encourage relevant groups to participate.

Through effective education and competition, outstanding students can further grow and become reserve talents for competitive sports in our country. During the learning process, students can learn the rules and technical and tactical knowledge of tennis-related referees. If you are interested, you can also participate in the training of tennis referees and social sports instructors to further promote the development of social sports in our country. Sports culture is the spiritual connotation of sports power, and tennis culture is also the soul of tennis development. Installing tennis walls on campus can help tennis lovers improve their sports skills, enhance sports confidence, and overcome inertia. Make tennis superstar posters on the tennis court, add luster to the tennis court, understand the knowledge and development of tennis players, play the star effect, make students aware of the meaning and importance of tennis, and promote it. Develop campus tennis. Tennis is the most fashionable, fun, and aesthetic sport, known as sports ballet for its unique beauty and rhythm. Creating a unique campus tennis culture is an important part of enhancing the soft power of my country's tennis culture. Since the promulgation of the "National Physical Fitness Standards for College Students" in 2007, the physical fitness test of Chinese college students has declined for the 13th consecutive year. Exercise is a good medicine. Formal college tennis education improves students' physical health and improves aerobic endurance, maximal oxygen uptake, lactate threshold, and the working ability of the nine major systems of the human body, and five of the human body. Two physical traits were improved. On the other hand, it can improve mental structure. Through tennis, ordinary college students can release negative emotions in their spare time, perceive, observe, remember, imagine, and guess during sports. Tennis also plays an important role in developing students' self-expression and performance, thereby developing their appreciation and expression skills.

This paper is organized as follows. Section 1 introduces the research background of tennis education quality evaluation model and the main structure of this paper; Section 2 introduces the status of domestic and international research in related fields and summarizes the research significance of this paper; Section 3 is the development of a tennis education quality assessment model based on improved genetic algorithm and back-propagation (GA-BP). Section 4 tests and analyzes the scenarios presented in this white paper. Section 5 summarizes the research content of this paper and looks forward to future research directions.

2. The Related Works

With the rapid development of educational information, high tech has been widely used in many aspects of tennis education and has achieved good results. However, research and practice to measure the quality of education, such as tennis education quality evaluation systems and evaluation models, are relatively lagging [10]. The traditional education quality model is ambiguous because the analysis and evaluation of education quality are a very complex nonlinear process involving multiple influencing factors and dynamic variables, which cannot solve various problems [11]. At present, most of the classification schemes of colleges and universities in China are based on diversified criteria, mainly including basic functions, discipline types, talent cultivation levels, school scale, and management system. The classification of colleges and universities according to these criteria will produce a variety of classification results. At present, scholars are conducting research on teaching quality evaluation models for different school types, different disciplines, and different majors [12, 13].

Some researchers have provided a more reliable and effective practice basis for studying the evaluation of medical graduate education quality and optimizing the evaluation system for medical postgraduates. This paper investigates the factors that affect the educational effect [14, 15]. Some papers combine the educational characteristics of general schools with the requirements of the Ministry of Education for military education, and the back-propagation (BP) neural network to achieve scientific, reasonable, and timely educational quality is based on the network. Establish a military academy education quality assessment system to assess the quality of military academy education [16]. Other researchers used the fuzzy comprehensive evaluation method to evaluate the educational quality of college physics MOOCs from three aspects: the achievement of educational goals, the rationality of educational content, and the appropriateness of educational evaluation and feedback. According to the evaluation results, the existing problems in the university were analyzed and the physics MOOC classroom guidance was carried out [17].

The advantages of the above methods are that they fully consider various evaluation factors and reflect experts' experience and knowledge; the disadvantage is that there is randomness and subjectivity in the evaluation process, which fails to take into account the nonlinear relationship between each evaluation index and the teaching effect, making the evaluation results highly subjective and failing to truly reflect the teaching quality. The artificial intelligence technology represented by neural network genetic algorithm is an emerging discipline in the field of information science and technology research, which is based on the structure and function of the human brain and uses neural network to simulate human thinking, so that it has the functions of self-learning and nonlinear transformation, thus overcoming the defects of the above methods. Genetic algorithms have evolved into more mature synthesis algorithms. In recent years, many researchers have used neural network methods to evaluate educational quality evaluation models. Some researchers use the BP neural network method to establish a model of the education quality evaluation system in colleges and universities, taking the concept of education evaluation index as input and quantifying the educational effect as output with clear data. Using MATLAB for empirical research, the application of this method in teaching quality evaluation can overcome the subjectivity of expert evaluation and the results are more correct, and the method has better applicability.

The widely used combinatorial algorithm is the BP neural network algorithm optimized for the genetic algorithm. This combined method has been widely used in prediction, classification, evaluation, speech emotion recognition, multi-objective optimization, and other aspects and achieved certain results.

To sum up, this paper proposes a tennis education quality evaluation model based on GA-BP neural network method. The result is the accuracy and convergence speed of the education quality evaluation model proposed in this paper when predicting the evaluation results.

3. Establishment of Teaching Quality Evaluation Model Based on Improved GA-BP Neural Network

In traditional genetic algorithms, the probability of variation operations occurring is determined based on empirical values. The mutation probability is constant during the operation of the algorithm-based model until the successful solution of the actual problem.

In this paper, we propose an adaptive mutation genetic algorithm (AGA). The calculation of the adaptive fluctuation probability P is shown in the following formula:

$$P = \frac{P_1 + P_2}{2} = \frac{\left(P_0 - (P_0 - P_{\min}) * m/M + P_0 * \max_{X_K \in \Omega} F(X_K)/\bar{F}\right)}{2}. \tag{1}$$

M is the maximum evolutionary generation, m is the current evolutionary generation, P_1 is inversely related to the evolutionary generation, P_2 is inversely related to the average fitness value, P_0 is the assumed initial variation probability, $P_{\min}$ is the minimum of the range of variation probability values, $\bar{F}$ is the average fitness value of the current population, and $\max_{x_t \subseteq \Omega} F(X_k)$ is the maximum fitness value of the current population.

The initial weight value and threshold can significantly affect the actual effect of the BP neural network. Generally speaking, the weights and thresholds of the BP neural network are given randomly. Based on this, researchers continuously adjust the weights and thresholds by designing algorithms and models. The most commonly used algorithm is the genetic algorithm. For the BP neural network, the threshold is relatively independent, and the range of genetic algorithm to find the optimal solution is the entire possible value space, so it can be improved based on the steepest descent method. Therefore, the shortcoming of the steepest descent method can be compensated. Algorithms usually correspond to local minima. In this paper, we use adaptive mutation genetic algorithm to improve the BP neural network. The adaptive mutation genetic algorithm BP (AGA-BP) neural network model mainly consists of two parts: the BP neural network part and the adaptive mutation genetic algorithm part.

A neural network can approximate any rational number if it can contain a sigmoid hidden layer and a linear output layer with bias. The more layers in the neural network, the closer the output is to reality. However, as the number of neural network layers' increases, the computational complexity continues to increase, and the computational time of the algorithm also increases. A neural network with two hidden layers is only needed when a discontinuous function is encountered. In other words, a multilayer feedforward neural network requires no more than two hidden layers. For most researchers, when modeling multilayer feedforward neural networks, it is usually not a priority to have two hidden layers but to design a model with only one hidden layer first. Therefore, this paper first tries to use hidden layers. Since the external data is input to the neural network through the input layer, the number of nodes in the input layer is determined according to the specific problem. The transfer function of the input layer is generally linear, i.e., $f(x) = x$. Trial and error method is one of the methods to determine the number of hidden layer nodes. By determining the initial value and doing more experiments, the results are few, and the optimal number can be analyzed. As shown in equation (1), there are three formats for determining the initial value by trial and error. These are (2) to (4), respectively, and this paper uses empirical formulas. Equation ((2)) determines the initial number of hidden layer nodes.

$$m = \sqrt{n + l} + a, \tag{2}$$

$$m = \log 2^n, \tag{3}$$

$$m = \sqrt{nl}, \tag{4}$$

where m is the number of nodes in the hidden layer, n is the number of nodes in the input layer, l is the number of nodes in the output layer, and a is a constant between 1 and 10.

A more commonly used nonlinear transfer function is the hyperbolic function equation.

$$f(x) = \frac{1}{1 + e^x}. \tag{5}$$

Generally speaking, the more experimental samples, the more accurate the reaction results, but once a certain amount is reached, the accuracy will be fixed within a certain range and will not change. The larger the network, the more complex the network mapping relationship. In general, the number of training samples is 5-10 times the total number of network connection weights. There are generally two

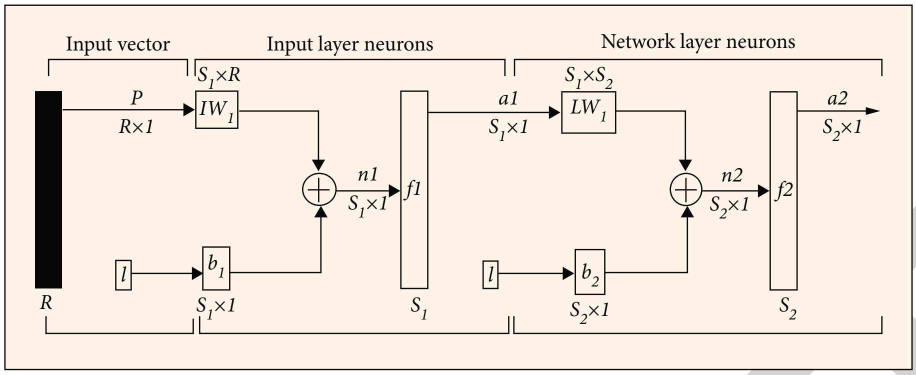

FIGURE 1: Vector model of multilayer neural network in MATLAB.

ways to choose initial weights for your network. The first way is to get the initial weights small enough. The second way is to make the initial value +1 and -1 equal weights. The learning rate is an important factor affecting the weight change in periodic training. If the value is too high, the system will become unstable. If the value is too small, the training time will be long, but the margin of error is guaranteed. There are two ways to stop training. One is to control the error range, and the other is to reach the maximum number of iterations and stop training as soon as one of these two conditions occurs. In general, multiple networks can be trained, and finally, an appropriate network is selected based on the analysis results.

The neural network vector model with a single hidden layer used in this white paper is shown in Figure 1 below in MATLAB.

P is the input vector of the neural network with the size $R \times 1$, as shown in the following equation:

$$p = [p_1, p_2, \cdots, p_R]. \quad (6)$$

b_1 is the threshold vector of the input layer neurons; the size is $S_1 \times 1$, as shown in Equation (4)–(7).

$$b_1 = \left[b_{1,1}, b_{2,1}, \cdots, b_{s_1,1}\right]. \quad (7)$$

IW_1 is the vector of connection weights of the input layer neurons with the input vector of size $S_1 \times R$, as shown in the following equation:

$$IW_1 = \begin{bmatrix} iw_{1,1}^{1,1} & iw_{1,2}^{1,1} & \cdots & iw_{1,R}^{1,1} \\ iw_{2,1}^{1,1} & iw_{2,2}^{1,1} & \cdots & iw_{2,R}^{1,1} \\ \cdots & \cdots & \cdots & \cdots \\ iw_{S_1,1}^{1,1} & iw_{s_1,2}^{1,1} & \cdots & iw_{S_1,R}^{1,1} \end{bmatrix}. \quad (8)$$

n_1 is the intermediate computation result of the first layer neuron, i.e., the weighted sum of the connection weight vector and the threshold vector, with the size of $S_1 \times 1$, as shown in the following equation:

$$n_1 = \mathrm{I}W_1 p + b_1. \quad (9)$$

a_1 is the output vector of the first layer neuron; the size is $S_1 \times 1$, as shown in the following equation:

$$al = f1(IW_1 p + b_1). \quad (10)$$

The entropy value method is used to calculate the normalized data and obtain the initial evaluation results, and the entropy value method is calculated as follows:

(1) The raw teaching quality evaluation data is standardized as shown in the following equation:

$$x'_{ij} = \frac{x_{ij} - \bar{x}}{s_j}, \quad (11)$$

where x_{ij} is the score value of the ith sample in the jth index, x_{ij} is the standardized value, and $\bar{x}$ and s_j are the mean and standard deviation of the jth indicator, respectively. In order to meet the logarithmic requirement of the entropy value method, the normalized value is shifted as shown in the following equation:

$$Z_{ij} = x_{ij}^{+} + A, \quad (12)$$

where Z_{ij} is the value after translation and A is the length of the translation.

(2) The teaching quality evaluation indexes were homogenized, and the proportion of the ith sample to the index under the jth index was calculated p_{ij}, as shown in the following equation:

$$p_{ij} = \frac{Z_{ij}}{\sum_{i=1}^{m} Z_{ij}} \quad (i = 1, 2, \cdots, m\,; j = 1, 2, \cdots, n), \quad (13)$$

where Z_{ij} is the leveled teaching quality evaluation data

(3) Calculate the entropy value of the jth indicator E_j, as shown in the following equation:

$$E_j = -k \sum_{i=1}^{m} p_{ij} \ln \left(p_{ij}\right), \quad (14)$$

where $k = 1/\ln(n), E_j \geq 0, p_{ij}$ is the weight of the ith sample in the indicator under the jth indicator

(4) Calculate the coefficient of variation of the j index G_j, as shown in equations (4)–(18):

$$G_j = 1 - E_j, \quad (15)$$

where E_j is the entropy value of the j indicator

(5) Normalize the coefficient of variation and calculate the weight of the jth indicator w_j, as shown in the following equation:

$$w_j = \frac{G_j}{\sum_{j=1}^{n} G_j}, \quad (16)$$

where G_j is the coefficient of variation of the jth indicator.

(6) Calculate the teaching quality of the ith sample F_i, as shown in the following equation:

$$F_i = \sum_{j=1}^{n} w_j p_{ij}, \quad (17)$$

where w_j is the weight of the jth indicator and p_{ij} is the weight of the ith sample under the jth indicator

This paper combines entropy method, improved genetic algorithm, and neural network to establish a tennis education quality evaluation model (EM-AGA-BP model) and uses adaptive fluctuation probability in the genetic operation process. It can reduce the complexity of the training process as well as the convergence speed of the neural network. The model not only utilizes the global search of genetic algorithm and the improved BP neural network through nonlinear mapping but also reduces the influence of nonobjective factors.

The process of building the model in this white paper is divided into six steps:

(1) This paper will analyze the existing tennis education evaluation system in detail, find out the advantages and disadvantages, improve it in a targeted manner, and propose a tennis education quality evaluation model

(2) Reasonably set up tennis education quality evaluation indicators, and collect evaluation data through questionnaires. After collection, the data is organized into training and test sets

(3) Set the parameters required by the BP neural network algorithm proposed in this paper, such as the maximum number of iterations, transfer function, learning rate, and number of hidden layer neurons

(4) Input the sorted raw data into the model, and train the neural network iteratively until the algorithm stops

(5) After the training, the tennis education quality evaluation test samples are input into the neural network, and the model effect is tested and analyzed. If the prediction result meets the interruption requirement, continue to the next process. Otherwise, go back to the previous step and rerun the model (training). In other words, go back to step (3)

(6) Input the sample into the trained teaching quality evaluation model, and output the tennis teaching quality evaluation result

4. Testing and Analysis

Questionnaire survey is a common way to obtain information. This study combines the theory and practice related to teachers' teaching quality evaluation, lists the factors influencing the evaluation results, develops the index system, designs the questionnaire, and distributes the returned questionnaires. The questionnaire designed in this paper was chosen in a comprehensive form, including multiple-choice questions and open-ended questions. Taking the educational quality evaluation system of theoretical courses as an example, the first part is multiple-choice questions. According to the 5 first-level indicators and 18 second-level indicators of the tennis education quality evaluation index system, the multiple-choice questions are designed and selected. Since the questionnaire in this paper is a quantitative questionnaire, it is the most appropriate from the perspective of multiple evaluation levels of each indicator. After choosing the correct one, you also need to score accordingly in a series of options. The second part is an open-ended question; from the aspect of analysis of data, the content of this part is not counted in the total score of the questionnaire. In the tennis teaching quality evaluation questionnaire, the answer options for some questions involve five answers: very conform (81-100), conform (61-80), generally conform (41-60), not conform (21-40), and very not conform (0-20). The main target of the questionnaire survey was undergraduate students in a university, and the distribution was entrusted to class leaders during class breaks. After screening, 1100 questionnaires were distributed, 1050 were recovered, and 1000 valid questionnaires were obtained. That is, the valid data is 1000 groups. In order to ensure the reliability and validity of the tennis education evaluation indicators, 100 online questionnaires were distributed first, and the test results were tested to test the reliability and validity of the test results. The questionnaires were distributed after each indicator met reliability and validity, and the questionnaire met both criteria.

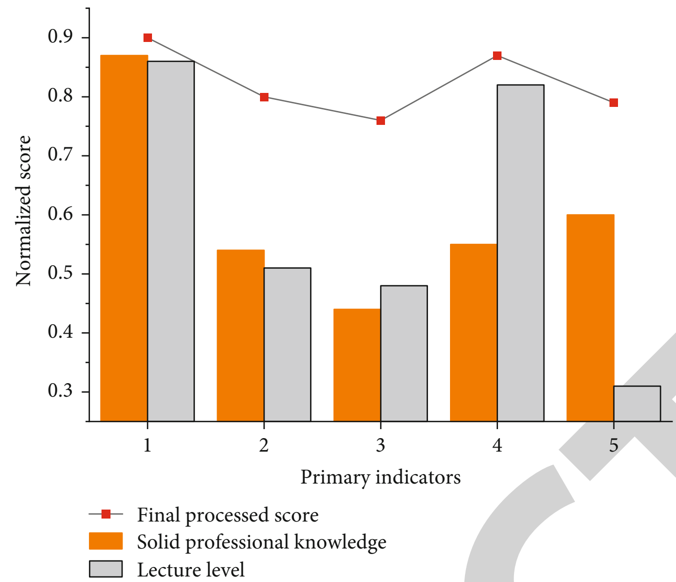

FIGURE 2: The standardized student evaluation section sample data.

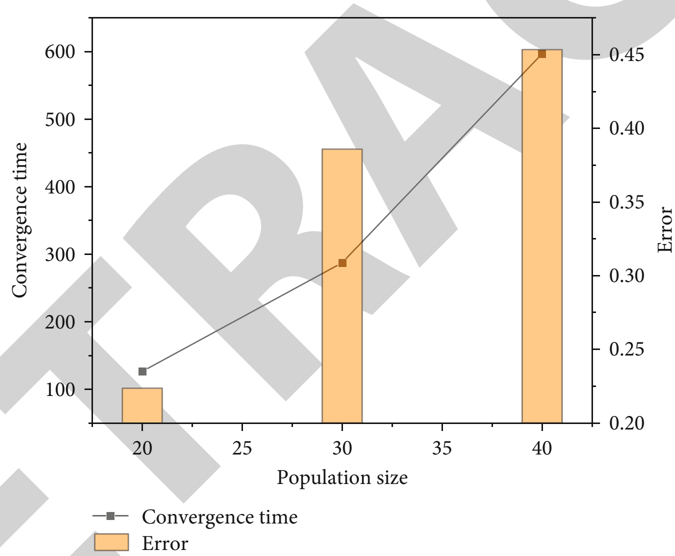

FIGURE 3: Initial population size training results.

According to the 5 primary indicators and the subdivided 18 secondary indicators in the index system for evaluating the teaching quality of theory courses, a questionnaire was developed; distributed; scored by students, using a percentage system; and collected to obtain experimental data. Second, the scoring data [0,100] were normalized to between [0,1]. In this paper, the maximum-minimum method of common normalization methods is used, and the calculation of this method is shown in the following equation:

$$X = \frac{I - I_{min}}{I_{max} - I_{min}}, \tag{18}$$

where X is the normalized score, which is the input value of the entropy method, I_{min} is the minimum value of the teaching quality score, I_{max} is the maximum value of the score, and I is the final processed score.

The standardized student evaluation section sample data are shown in Figure 2.

In order to obtain a better initial population size, we set the initial population size to 20, 30, and 40 according to the range of the initial population size in this paper. The training results of the population size are shown in Figure 3.

Figure 3 shows that the initial population size is 20, the minimum convergence time is 126.37, and the minimum error is 0.2236. Therefore, the initial population size is 20. Set the crossover probability to 0.66. For more complex solution spaces, real encoding can be used without decoding. Therefore, this encoding method is used to encode feasible solutions, and the optimal solution is directly used as the initial weight and threshold of the BP neural network. It

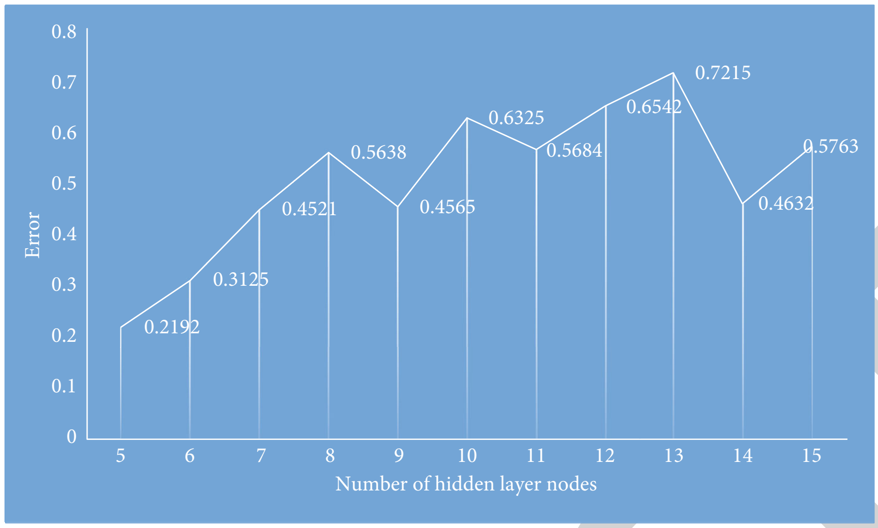

Figure 4: The number of nodes in the hidden layer of the network and the error.

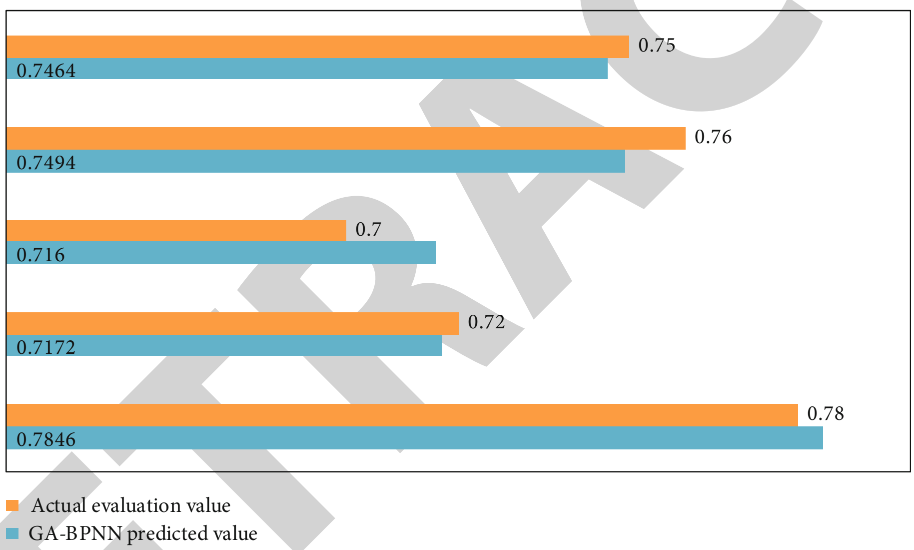

Figure 5: Teaching quality evaluation model prediction results.

consists of four parts: the connection weight from the layer to the hidden layer, the connection weight from the hidden layer to the output layer, the hidden layer threshold, and the output layer threshold. The code length is 101.

A better way to build the network has not been found yet. The structure and weight factors of a neural network can be determined by describing a specific mapping or by approximating an unknown mapping, while the structure and weight factors of a neural network are obtained through continuous experiments to obtain the network model and can only be determined through continuous experiments, through learning. Meet the requirements. In a nutshell, learning a neural network is the continuous practice of a particular network until you get a weight value that minimizes the value of the error function. In the process of designing a neural network, the main focus is on the analysis of experiments and training results, and if the results are not satisfactory, continue training. In order to reduce the complexity of the experiment, first choose a hidden layer, and then, first determine the number of hidden layer nodes to use according to the empirical formula. Depending on the results of each experiment, increase or decrease the number of hidden layer nodes until you get the performance you want. A three-layer neural network can actually solve more complex problems and appropriately increase the number of layers to improve the accuracy, but as the number of layers' increases, the network becomes more complex. You can also increase the error accuracy by increasing the number of neurons in the hidden layer. From a structural implementation point of view, it is easier to increase the number of hidden layer nodes than to increase the hidden layer, and the training effect is easier to observe and adjust, so in this article, we will look at the accuracy and efficiency of the network. The layer node changes.

The education quality evaluation model in this paper sets the neural network as a single hidden layer, that is, a three-

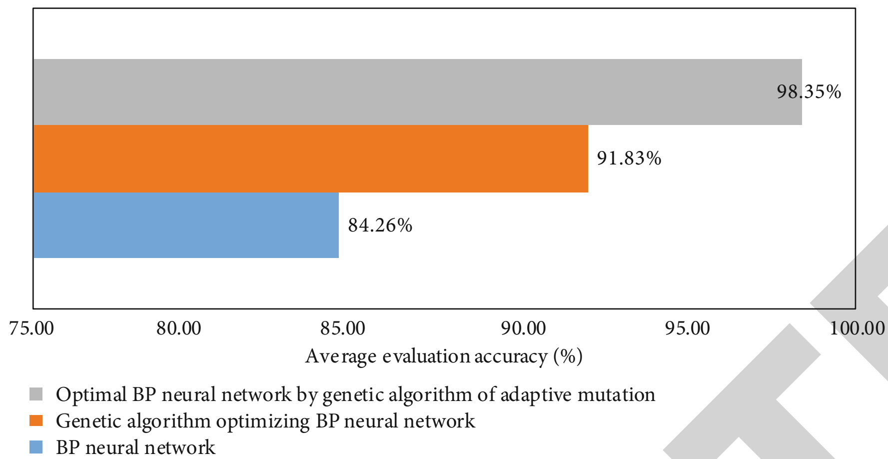

Figure 6: Model performance comparison.

layer neural network. After repeated experiments, the topology and parameters of the selected BP neural network are as follows. The number of neurons in the input layer is set to 18. The number of hidden layer nodes in the BP neural network is set to 5. The output layer node is 1.

In the process of determining the number of hidden layers, this paper calculates according to the empirical formula and sets the initial number of hidden layer nodes to 5. The experimental results are shown in Figure 4. If the number of hidden layer nodes is 5, you can see that the error is minimized. Therefore, the number of hidden layer nodes in the BP neural network is set to 5.

Since the indicators of the education quality evaluation system established in this paper are all positive indicators, the step of data balancing is omitted, and the preliminary evaluation results of education quality are determined according to the steps of the entropy method shown in Figure 2.

A total of 1000 groups of data were finally decided to participate in the experiment, of which 900 groups were used to train the model to obtain the optimal BP neural network structure, and the remaining 100 groups of models were used for performance testing. By implementing model validation and measurement, we found that the model can evaluate education quality in a timely and scientific manner. Figure 5 shows the prediction results of the education quality evaluation model.

Figure 6 shows the results of the mean evaluation accuracy comparison. The average accuracy rate of BP neural network model for evaluating 100 sets of data is 84.26%, and the average evaluation accuracy rate of BP neural network model optimized by genetic algorithm is 91.83%. The average evaluation accuracy of BP neural network optimized by genetic algorithm based on adaptive mutation is 98.35%, which is increased by 13.99% and 6.42%, respectively, higher than the two, respectively. It can be seen that the evaluation results of the BP neural network optimization method based on the adaptive mutation genetic algorithm are very satisfactory.

5. Conclusions

(1) Assessing the quality of tennis education is a very complex and ambiguous nonlinear process, and building a mathematical model is even more complicated because multiple factors and variables are involved. BP neural network is more suitable for solving complex problems of internal mechanism than other algorithms. It has the ability of self-learning and generalization and can represent more complex nonlinear mapping, but it is local optimal, and the disadvantage is that it is easy to fall into and the convergence is very slow (speed). Aiming at the above problems, this paper proposes an improved genetic algorithm to optimize the BP neural network and combines the entropy method to establish a tennis education quality evaluation model

(2) In this paper, the entropy method is improved, and an optimization evaluation model based on adaptive genetic algorithm is established. In this paper, 900 students' questionnaire survey data are used as training samples, and 100 students' questionnaire survey data are used as prediction samples. The prediction results show that the average evaluation accuracy of the BP neural network model for 100 groups of data is 84.26%, and the average evaluation accuracy of the BP neural network model optimized by genetic algorithm is 91.83%. The average evaluation accuracy of the BP neural network optimized by genetic algorithm based on adaptive mutation is 98.35%. The evaluation results of BP neural network optimization method based on adaptive mutation genetic algorithm are very satisfactory

(3) This paper has made some achievements, but there are still some problems to be further studied to improve the evaluation model and improve the prediction accuracy of the model

Data Availability

The figures used to support the findings of this study are included in the article.

Conflicts of Interest

The author declares that there are no conflicts of interest.

Acknowledgments

The author would like to show sincere thanks to those technicians who have contributed to this research.

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