

Retraction

Retracted: Design and Implementation of Intelligent Teaching System Based on Artificial Intelligence and Computer Technology

Security and Communication Networks

Received 20 June 2023; Accepted 20 June 2023; Published 21 June 2023

Copyright © 2023 Security and Communication Networks. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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

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

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

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

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

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

References

- [1] S. Xu, T. Wang, J. Dai, and D. Wu, "Design and Implementation of Intelligent Teaching System Based on Artificial Intelligence and Computer Technology," *Security and Communication Networks*, vol. 2022, Article ID 6300299, 12 pages, 2022.

Research Article

Design and Implementation of Intelligent Teaching System Based on Artificial Intelligence and Computer Technology

Shuai Xu ¹, Ting Wang ², Jiahai Dai ³ and DanLin Wu ⁴

¹College of Intelligent System Science and Engineering, Shenyang University, Shenyang 110044, Liaoning, China

²Shenyang Institute of Automation, Chinese Academy of Sciences, Shenyang 110016, China

³College of Electronic Science and Engineering, Jilin University, Changchun 130012, Jilin, China

⁴Laiye Network Technology Co, Ltd., Beijing 100000, China

Correspondence should be addressed to Shuai Xu; xushuai21@syu.edu.cn and Ting Wang; wangting18@mails.jlu.edu.cn

Received 11 April 2022; Revised 12 May 2022; Accepted 20 May 2022; Published 16 June 2022

Academic Editor: Mohammad Ayoub Khan

Copyright © 2022 Shuai Xu et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

The purpose of this paper is to investigate and research the intelligent teaching system based on artificial intelligence (AI) and computer technology, which can provide a better education platform for the majority of education and teaching workers and also help college students improve their learning efficiency. This paper first introduces AI, system modules, computer technology, and some algorithms for establishing intelligent teaching systems, specifically introducing student modules, Bayesian algorithms, and so on, and then introduces intelligent teaching based on AI and computer technology. The experimental results show that the intelligent teaching system based on AI and computer technology has improved the teaching efficiency and management ability of the school, and the help of students has also played a great role. The intelligent teaching system not only helps students improve their learning efficiency by 9.8% but also is favored by 56.8% of teachers and students.

1. Introduction

The advancement of the Internet and computer technology has made people's demand for computers continue to increase. The network-based education method solves the bottleneck that relies heavily on time and space in communication learning. At the same time, through the online education system, students can virtualize the actual campus facilities and resources and can enter the education system without additional learning. With the continuous progress of computer AI and other technologies, the intelligent network teaching system provides students with a one-to-one personalized guidance learning system, which students can use at any time. The intelligent education system uses a variety of technologies such as computer networks, digital multimedia, and AI, as well as a combination of traditional education methods such as simulations, tests, and examinations [1, 2]. The current online learning system has two forms. One is to design the content of online courses into web pages, use hypertext links to form a hypertext

hypermedia system, and provide some navigation mechanisms. For example, students can read the content index table, page forward button and back button, etc., for free. Another method is to convert the classroom video into a streaming media format that can be played on the Internet and then compare it with the classroom notes. Such a student can click to play on the Internet. However, the performance of this instructional design is a static form of hypermedia, which cannot reflect the process of educational activities. The textbooks are arranged in hypertext because students have to learn independently, so they can learn easily. In the learning process, students can easily deviate from the learning direction of the school and the students themselves.

The establishment of the intelligent education system is based on cognitive science, comprehensively using the results of AI technology, educational psychology, computer science, and other fields to implement effective educational technology for students. The intelligent education system based on AI technology combines the advantages of

traditional systems as well as the characteristics of AI and computer technology. Over the years, with the continuous development of AI and computer technology, the development of intelligent teaching systems has been able to develop in a higher and better direction, which has further promoted the development of modern education.

In recent years, with the continuous development of AI technology, the application field of AI is also constantly developing. In a publicly published article, Bui D T proposed and verified a new hybrid AI method, called Particle Swarm Optimization Neural Fuzzy (PSO-NF), for spatial modeling of tropical forest fire susceptibility. In the proposed method, a neurofuzzy (NF) inference system is used to build a forest fire model, and particle swarm optimization (PSO) is used to study the optimal values of model parameters [3]. Labovitz et al. used an AI platform to conduct research on measuring and improving the drug compliance of anticoagulant therapy for stroke patients. Studies have shown that the introduction of direct oral anticoagulants, while reducing the need for monitoring, also puts pressure on patients for self-management [4]. In education, the application of AI is also gradually expanding. Timms said that the AI-enabled education industry (AIED) based on AI technology is now mature enough to get rid of the transmission method mainly through computers and tablets so that it can interact with students in new ways and help teachers teach more effectively [5]. Not only that, Burton et al. as an educator has also practiced. They also pointed out that the recent surge in interest in AI ethics may make many educators wonder how to solve moral, ethical, and philosophical issues in their AI courses [6]. Of course, with the increasing use of AI technology, AI technology is also constantly improving. Chatila et al. made a report on the scope, goals, and initiatives of the IEEE Global AI and Autonomous System Ethical Consideration Initiative at a conference, aiming to establish more scientific AI technology and continuously improve the application of AI in modern life [7]. Craswell et al. used computer technology to monitor the mortality and morbidity of mothers and infants and other population health data collected around the world to generate perinatal data [8]. Wu pointed out that intelligent teaching systems are the top priority in the teaching field. In this process, there is no need for human tutors to participate, and the student model is the core of the intelligent teaching system [9]. Although these studies presented that the intelligent teaching system made by using computer technology and AI technology is conducive to the development of modern teaching, its production and maintenance costs are high, the required technical requirements are also high, the realization is difficult, and its practical is also not strong enough.

The innovation of this paper is primarily to combine existing research on intelligent education systems, using AI and computer technology to record and dig out students' actions, footprints, and results in traditional educational activities. Combine artificial intelligence technology and computer technology to establish a model of students and teacher managers in the teaching process, and conduct intelligent teaching management based on this model. The school should construct a student model that suits the

students' individual characteristics and design and implement specific knowledge areas and intelligent personalization on the basis of this research [10–12]. Secondly, the establishment of an intelligent education system based on AI and computing technology has established a more efficient platform for the school's future distance education. Its advantages are that it provides a good auxiliary means for school teaching [13]. The research and development of the intelligent education system has played a certain role in promoting the innovation of school teaching method, teaching method, and teaching mode. The most innovative aspect is that parents of students can supervise the learning of teachers and students online through the intelligent teaching system established by the school, making the school's teaching methods more transparent and also supervising the children's every move in school for parents [14].

2. The Method of Establishing an Intelligent Teaching System Based on AI and Computer Technology

2.1. The Establishment of Student Learning Model. The student's learning model at school is the basis for the establishment of an intelligent teaching system. Only by continuously improving the research and establishment of the learning model of students at school can we better reason and track the learning situation of students so as to establish an understanding of each student one-to-one learning system [15]. Make sure that every student can understand the learning system so as to achieve the maximum teaching effect. At present, there are also some problems with the establishment of student models. Generally speaking, there are many difficulties in students' large base, different personalities, and sharing of student information.

2.1.1. The Overall Structure of the Student Learning Model. The overall structure of the learning model includes three aspects. One is the basic information of the student, which includes the student's name, gender, age, student number, class, and academic performance over the years. The basic information of these students is the most critical source of information for the initialization of the student learning model [16]. The second is the student's personal hobbies, especially the students' learning hobbies, such as which aspects of knowledge students are more interested in and what learning methods they prefer. The third point is the student's personal learning performance. Learning performance is reflected in the changes in students' cognitive ability and knowledge learning. It is very important to correctly evaluate the method of cognitive ability model [17]. Through the student's test performance, the cognitive ability of each knowledge item is statistically analyzed, and the overall cognitive ability of the student is formed in an all-round way. Figure 1 shows the overall structure of the student learning model.

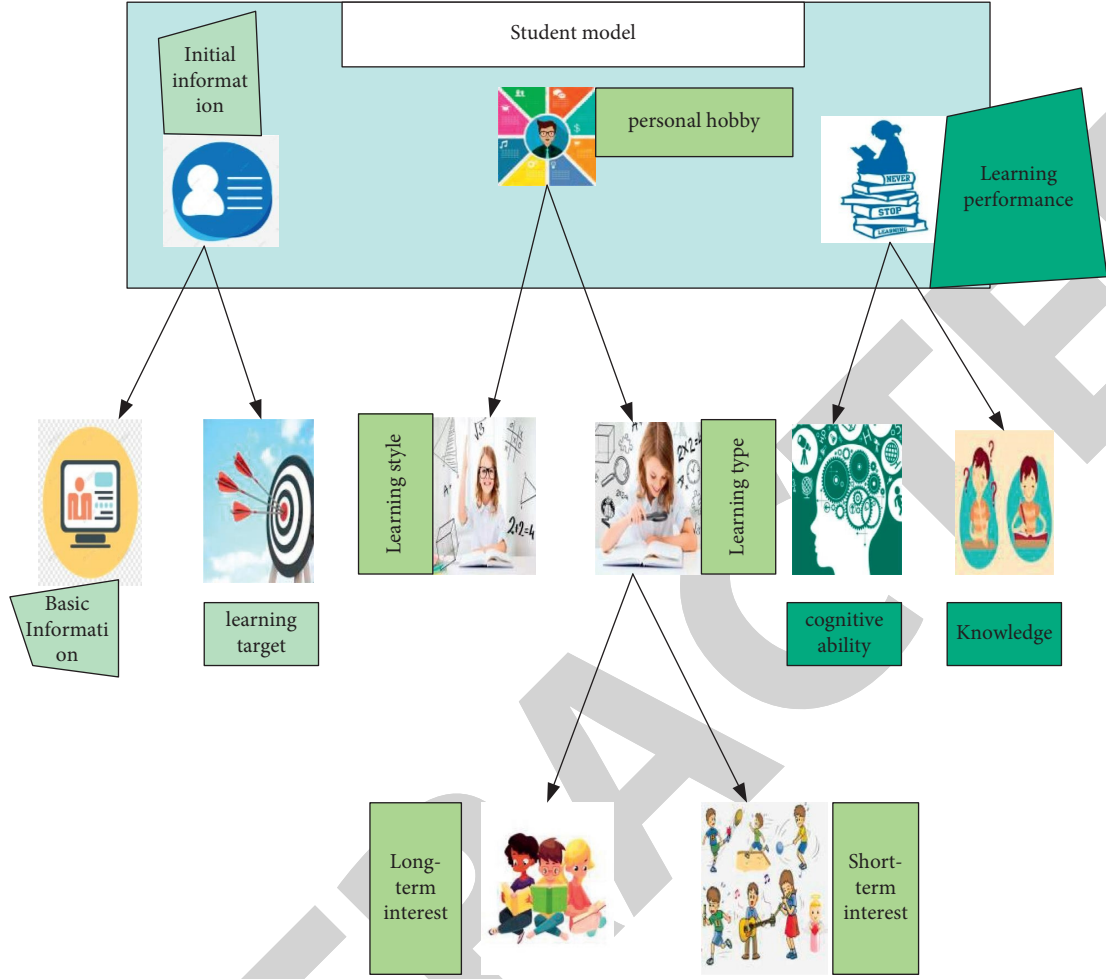


FIGURE 1: The overall structure of the student learning model.

2.1.2. Analysis of the Learning Model. To establish a student's learning model, it is necessary to conduct an overall analysis [18]. First, make a model analysis of students' hobbies, use feature vectors to define the form of learning resources, and record students' browsing, learning, testing, and learning resources corresponding to other actions so as to simulate students' interests. Among them, the formula defined by the eigenvector is

$$W = \{(a_1, b_1, c_1), (a_2, b_2, c_2), \dots (a_n, b_n, c_n)\}. \quad (1)$$

Due to the consideration of differences in interest and the need for continuous development, the model is defined as

$$\text{model} = \{(a_1, S_1^d, S_1^r, d_1, c_1, p_1), \dots (a_n, S_n^d, S_n^r, d_n, c_n, p_n)\}. \quad (2)$$

Among them, a_n is the feature item; S_n^d is the short-term interest weight of a_n ; S_n^r is the long-term interest weight of a_n ; d_n is the update time; c_n is the sort of a_n ; p_n is the parent feature item of a_n ; when there is no parent feature item, p_n will be 0.

The short-term interest calculation formula is as follows:

$$S_n^d = \frac{1}{t} \sum_{g=1}^t \frac{1}{D_m} \sum_{k=1}^{D_m} s(a_n, i_n), \quad (3)$$

where T is the statistical time size (usually in days). S refers to the page feature weight, and the calculation formula is as follows:

$$s(a_n, i_n) = \frac{q(a_n, i_n) * \lg((w/wa_n) + 0.01)}{\sqrt{\sum_{i_n \in R}^{a_n \in A} * \lg((w/wa_n) + 0.01)}} * \text{const}(i_n). \quad (4)$$

Among them, $q(a_n, i_n)$ is the number of times that page i_n contains a_n ; A is the set of feature items; R is the set of pages; w is the total number of pages; w, a_n is the number of pages with a_n ; $\text{const}(i_n)$ is a parameter in i_n .

When evaluating long-term benefits, time benefits and short-term benefits should also be combined [19]. The calculation method is as follows:

$$S_n^r = S_n^{r-\text{pre}} * E \frac{xq^2}{x * q^{cfe}} (w - w_n) + S_n^d. \quad (5)$$

In the information mining of students' browsing pages, the time spent by students browsing the learning page resources and the length or size of the learning resources are

the main mining objects. The student browsing speed calculated through these two pieces of information reflects the students' learning resources [20]. Generally speaking, the slower the browsing speed is, the more careful the student browses and the more interested he is in this resource; on the contrary, faster browsing speed means that the student turns off the browsing of this resource immediately if they are not interested [21]. The flowchart used is shown in Figure 2.

After analyzing the student's interest model, the next step is the construction and analysis of the student's self-cognition ability model. The first thing to do is to use the vector calculation method to test the students themselves [22–24]. Record the results after testing the selected problem type. Suppose that after the students have tested the English spelling type questions many times, the cognitive vector of the given test question is

$$AQ_I = \{tp(1), tp(2), tp(3), tp(4), tp(5), tp(6)\}. \quad (6)$$

According to the students' self-assessment results, the data shown in Table 1 are obtained.

The correct usage rate of knowledge point 1 in this type of question type is $I(N)$:

$$I(N) = \frac{I(1)}{I(1) + I(1 - 1)}. \quad (7)$$

The obtained cognitive ability vector is WQ:

$$WQ = I(1 * Wai). \quad (8)$$

Because there are many types of questions, each student's mastery is different:

$$WE = \{WE_1, WE_2, \dots, WE_n\}. \quad (9)$$

Calculate the student's cognitive level formula O:

$$O = TI * WE. \quad (10)$$

Through the self-cognition test and analysis of students, the most basic student self-ability analysis model can be established so as to better help the intelligent teaching system to provide personalized help for every student.

The above are the test results of students' self-built question bank based on vector recording, and the conclusions reached are not accurate. In order to better and accurately establish the student's learning model, modeling should also be based on the test results of vector recording expert question bank.

For the questions given by the expert question bank, there are many kinds of questions. Each question has been set in the question bank during the entry process of the cognitive abilities that can be obtained during the test. When students choose an expert question bank to conduct an authoritative test on themselves, the test results will be recorded in a vector table. The structure of the vector table is shown in Table 2.

For the value in this table, when the student tests the question corresponding to the question number, if the student answers this question correctly, then the cognitive ability marked at the time of entry corresponds to a score of

1, and if the answer is incorrect, the value is -1 ; of course, the unmarked cognitive ability item in this question will take the value 0. Suppose students test multiple-choice question types and calculate cognitive ability based on the test results. The calculation method is

$$Q_R = \frac{E_{RI}(1)}{E_{RI}(1) + E_{RI}(-1)}, \quad (11)$$

where Q_R is the number of single-choice questions in the test and $E_{RI}(1)$ is the total number of correct answers to the category of cognitive ability during this test.

The matrix W of cognitive ability is obtained:

$$W = \begin{pmatrix} a_{11} & \dots & a_{16} \\ \vdots & \ddots & \vdots \\ a_{51} & \dots & a_{56} \end{pmatrix}. \quad (12)$$

Adding the weight vector C, evaluation result is obtained by the student after the test as F:

$$F = C * W = (F_1, F_2, F_3, F_4, M_5, M_6). \quad (13)$$

Calculate the comprehensive cognitive ability D obtained by students during this test:

$$D = \sum_{I=1}^6 W_I * E_I. \quad (14)$$

2.2. The Establishment of Teacher and Administrator Modules

2.2.1. The Establishment of Teacher Module. The teacher module mainly arranges the teaching content dynamically according to the teaching goal and the student model. The establishment of teacher module is mainly to ensure that the teaching process of teachers is rigorous, standardized, and targeted. The database connected with it mainly reflects the student's cognitive library, learning data library, and teaching strategy library.

Its structure model is shown in Figure 3.

The description of the teacher module is as follows: (1) The knowledge base includes a learning resource library, a teaching strategy library, and a question bank. (2) The teaching controller includes a function module and an inference engine. (3) The function module includes a question bank query, modification, deletion, addition, and learning resource library query, change, delete, add, teaching strategy database query, change, delete, add, discussion and Q&A area startup, management, and related database query. (4) Related databases include cognitive status database, student basic information, and test record database.

The establishment of the teaching strategy database is the most important task of the teacher's teaching module. The database of teaching strategy is shown in Table 3.

The related databases are described as follows: learning resource library: store teaching content and update teaching

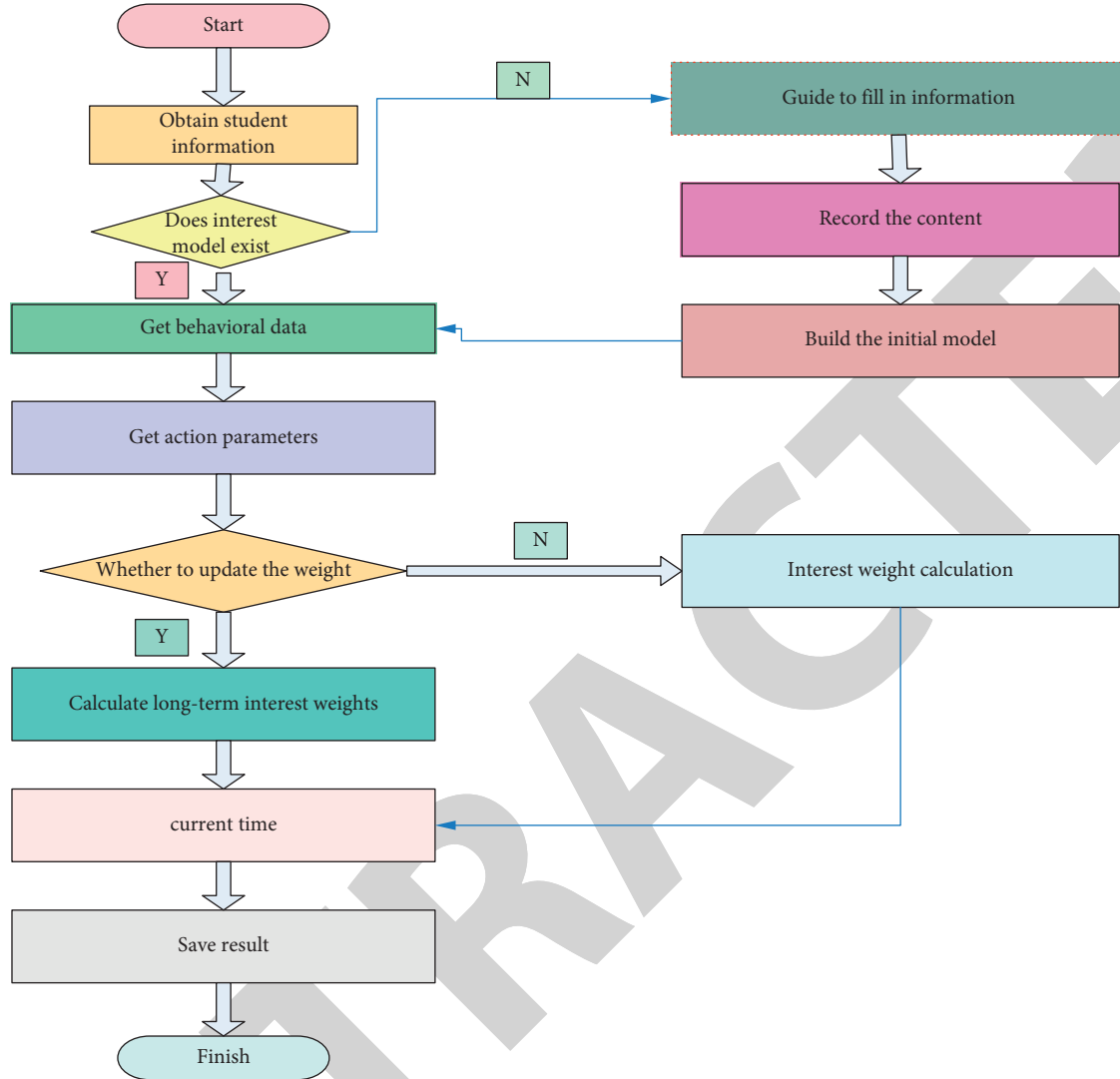


FIGURE 2: Algorithm flowchart of the generation and update of the learning interest model.

TABLE 1: Test result table.

Knowledge points	Correct number of tests	Number of test errors
1	$I(1)$	$I(1-1)$
2	$I(2)$	$I(2-2)$
3	$I(3)$	$I(3-3)$

content; teaching strategy library: include class types, key points, difficulties, and teaching requirements and contain teaching methods (may be more species); question bank: store all kinds of test questions to check the learning effect of students, used for examinations and in-class tests.

2.2.2. Establishment of Management Module.

- (1) The structural model of the management module is shown in Figure 4.
- (2) The definition of the management module is as follows.

The knowledge base includes educational administration information database, teacher information database, and student information database; controller refers to a functional module and inference engine.

The functional modules include management information release, student information query and change, teacher information query and change, and related database query and maintenance.

2.3. Bayesian Network. Bayesian network probabilistic reasoning analyzes the position and forecast trend of intelligent teaching system parameters by observing the probability distribution data and obtains the optimal solution and the best effect. The mathematical description is

$$C(P|H, L) = \frac{C(P|L) * C(H|P, L)}{C(H, L)}, \quad (15)$$

where L is prior information, H is additional evidence, and P is trust: $C(P|H, L)$ is the posterior probability; $C(H|L)$ is the

TABLE 2: Test result vector table.

Question number	Memorize	Understand	Application	Analyze	Comprehensive	Evaluation
1	0	1	0	1	-1	1
2	1	-1	-1	1	0	-1
3	1	0	-1	-1	1	0
...
n	-1	1	1	-1	-1	1

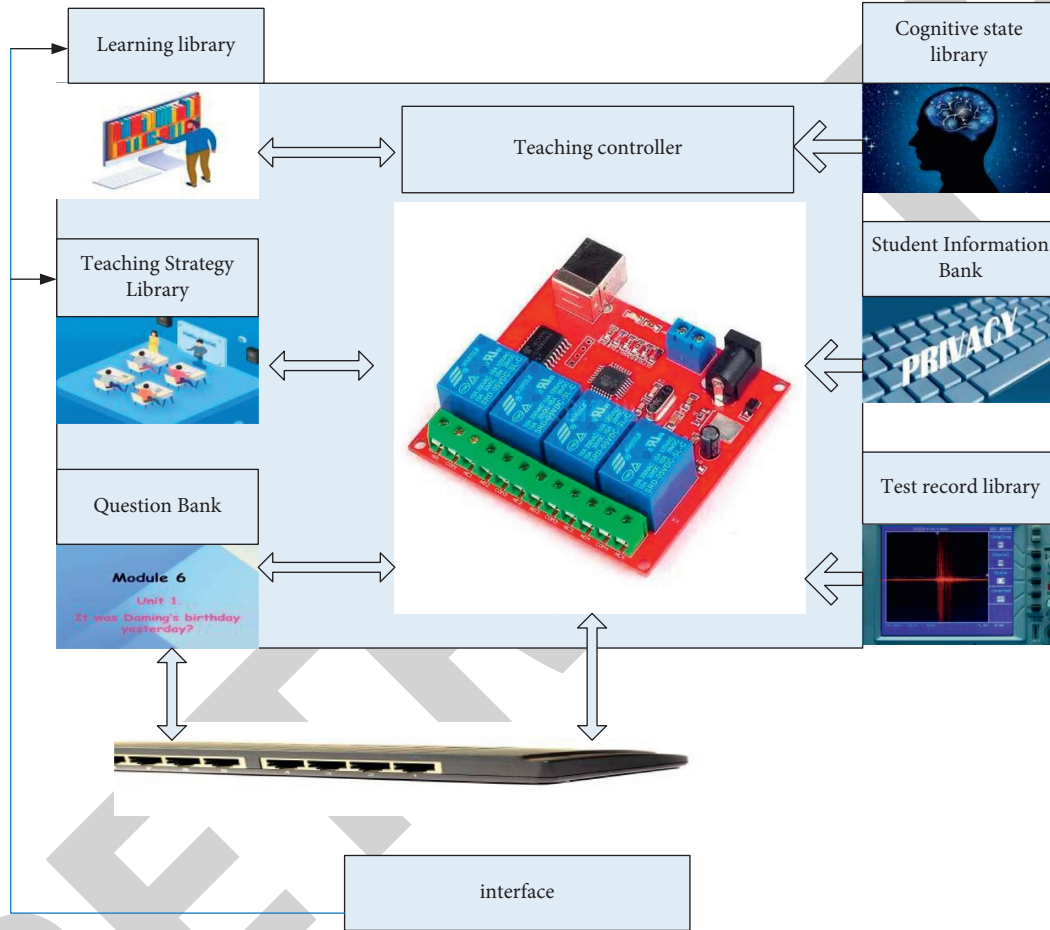


FIGURE 3: Teacher module structure model.

TABLE 3: Teaching strategy table.

Field name	Type of data	Illustrate
ID	Int	Strategy number
Ability	Int	Cognitive ability value
Result	Int	Test result of learned knowledge
Bool	Int	Whether to learn new knowledge
Hint	Int	Hint

prior probability of H under the condition of a given L ; $C(H|P, L)$ is the likelihood, which is the probability of evidence H , of course, assuming that P and L are both true; $C(H, L)$ is the scale factor, which is independent of P .

Bayesian network was proposed by Pearl in 1988. It is a valuable tool in data analysis and uncertainty reasoning, and it can assist humans in applying probability theory to a larger field.

Define a Bayesian network as follows: $A = \langle B \rangle$.

Among them, B is a directed acyclic graph with a set of random variables Y as the vertex, and the function logic relationship is an arc. Assuming that the set of parent variables of the vertex random variable Y_i of B is π_i and P is the conditional probability of Y_i event occurring under the premise of the occurrence of π_i event, the joint conditional probability distribution on the set of random variables Y is defined as

$$P(Y_1, Y_2, Y_3, \dots) = \prod P(Y_N | \pi_N). \quad (16)$$

Bayesian network probabilistic reasoning obtains the optimal decision by observing the probability distribution data and calculating the probability.

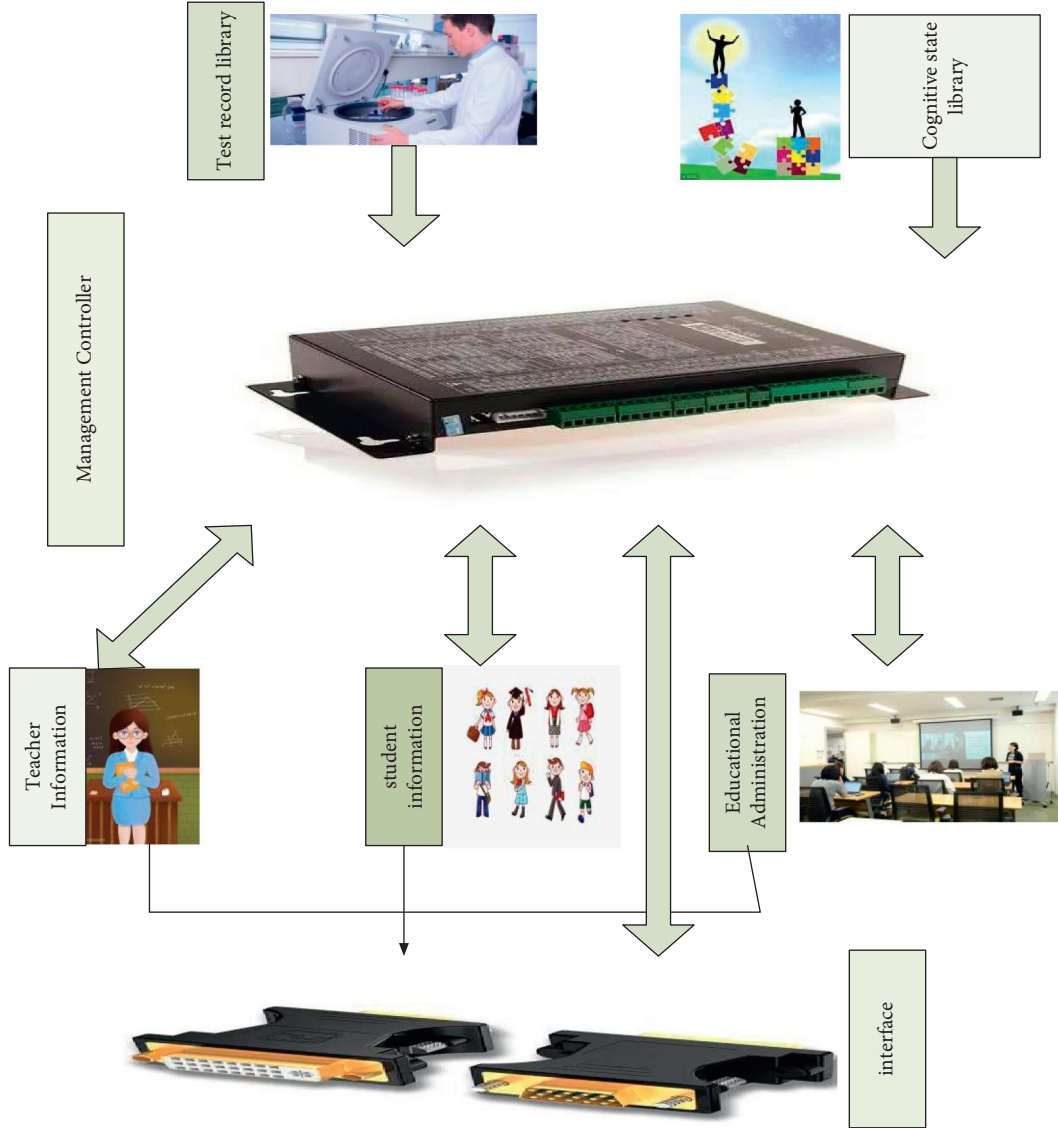


FIGURE 4: Management module structure model.

2.4. Fish School Algorithm. By constructing artificial fish to simulate fish feed, clustering, and collision behavior, we achieve optimized effects.

2.4.1. Predatory Behavior. Suppose the current state of the artificial fish is A_i and a state B_i is randomly selected. As we all know, we can transform the maximum problem into the minimum problem, so in this example, the maximum problem is used as an example for the next discussion. If the biggest problem is $Q_i < W_j$, then the selected fish should move one step in this direction; otherwise, randomly select a state A_j to determine whether it meets the preset forward

condition; if not, it will move one step randomly. The rules for step movement are as follows:

$$\begin{cases} A_{i+1} = A_i + \text{Step} \frac{B_i - A_i}{\|B_i - A_i\|} (Q_j > Q_i), \\ \text{Step}(Q_j \leq Q_i). \end{cases} \quad (17)$$

$$A_{i+1} = A_i +$$

2.4.2. Cluster Behavior. The artificial fish searches for the partner number NF and the center position X in the current situation; this means that there is enough food in the center of the fish school, where it is not too crowded.

The relevant mathematical simulation formula for cluster behavior is

$$\begin{cases} A_{i+1} = A_i + \text{Step} \frac{C_a - A_i}{\|C_a - A_i\|} \left(\frac{B_a}{\text{NF}} > \partial B_i \text{ and } \text{NF} \geq 1 \right), \\ A_{i+1} = \text{Defalut Formula} \left(\frac{B_a}{\text{NF}} \leq \partial B_i \text{ or } \text{NF} = 0 \right). \end{cases} \quad (18)$$

The current state of the artificial fish is A_i , and the number of companions in its visible area is NF to form a set G :

$$G = \{B_j | B_j - B_i \leq \text{Visual}\}, \quad I, J = 1, 2, 3, \dots, n. \quad (19)$$

If K is not an empty set, it indicates that there is a companion in the field of view; that is, $\text{nf} \geq 1$; then use formula (20) to explore the center position X_c :

$$C_a = \sum_j^{\text{NF}} \frac{B_j}{\text{NF}}. \quad (20)$$

Among them, X_c represents the state of the center seat.

2.4.3. Following Behavior. Suppose A_i is looking for the current state of partner A_{\max} with B_{\max} nearby if it can be seen that the current location of partner A_{\max} has higher food consistency and keeps it not crowded. AF will take a step towards its partner A_{\max} ; otherwise, go to search behavior. This behavior can be expressed by the following mathematical description:

$$\begin{cases} A_{i+1} = A_i + \text{Step} \frac{C_a - A_i}{\|C_a - A_i\|} \left(\frac{B_{\max}}{\text{NF}} > \partial B_i \text{ and } \text{NF} \geq 1 \right), \\ A_{i+1} = \text{Defalut Formula} \left(\frac{B_{\max}}{\text{NF}} \leq \partial B_i \text{ or } \text{NF} = 0 \right). \end{cases} \quad (21)$$

3. Experimental Design and Result Analysis

3.1. Design of an Intelligent Teaching System Based on Computer Technology. In order to realize the modernization of education and teaching, a school reformed and upgraded the school's teaching system. The following table is part of the database and part of the interface display established by the school in the reform of the course selection system, as shown in Table 4.

The data in the previous table are all extracted from the actual situation. The school conducted some investigations on teachers and students. The results of the investigation and analysis are shown in Figure 5.

Based on the above experimental data, we can conclude that the improved course selection system based on computer technology is quite feasible and can be used to assist in the production of online course selection system. In addition, the use of database technology to evaluate students' online learning and monitor their learning efficiency is also a

major goal of building an intelligent teaching system. Table 5 is the test storage structure table of the intelligent teaching system.

As shown from the above table, each module of the storage table structure is longer. In order to facilitate the management of the system's question bank and at the same time consider reducing the complexity of system function implementation, the question bank has designed a database table for each question type.

Through the monitoring and analysis of the data, a schematic diagram of the students' cognitive ability and cognitive ability improvement in school can be drawn, as shown in Figure 6.

Through the analysis of the effect of students' learning performance, it can be seen that, through the intelligent teaching system, students can improve their self-cognition ability and level more quickly and discover their deficiencies in time.

3.2. Design and Analysis of Intelligent Teaching System Based on AI Technology. When designing the intelligent teaching system, the school used AI technology to combine with the teaching system, used the combined model for construction, and obtained the advantage diagram of the combined model and other models in the intelligent teaching system, as shown in Figure 7.

The ordinate represents the evaluation value of the interest model, self-cognition model, and self-ability model. The performance of the combined model compared with other models has increased by 5.8%, 6.9%, and 12.5%, respectively.

On the whole, the differences between the proposed combination model and other models mostly pass the 90% significance test, indicating that the combination model proposed based on AI technology has a better effect on the establishment of an intelligent teaching system. Figure 8 shows the comparison of the test results of each model and the combined model.

3.3. Combination Analysis of Intelligent Teaching System Based on AI and Computer Technology. A partial schematic diagram of an intelligent teaching system is shown in Figure 9.

Through the user experience survey of the new system, an intelligent teaching system development company obtained the following table data as shown in Table 6.

Through the analysis of survey data, it can be concluded that more than 50% of users are satisfied with the intelligent teaching system, and only about 20% of users are not satisfied with the system. The intelligent teaching system developed by using AI and computer technology can not only help group students to learn better but also enable a broad group of teachers to share teaching resources and improve teaching efficiency. At the same time, it also facilitates the school's management of teaching. It is of great significance to promote the development of intelligent teaching and the progress of education.

TABLE 4: Course selection system database.

Serial number	Field name	Type of data	Illustrate
1	Course_Id	Char (20)	Empty string is not allowed
2	Teacherid	Char (20)	Allow empty string
3	Course_Name	Varchar (50)	Allow empty string
4	Course_Start	Varchar (50)	Allow empty string
5	Course_End	Varchar (30)	Allow empty string
6	Status	Char (1)	0 is valid; 1 is invalid
7	Course_Memo	Varchar (500)	Course introduction

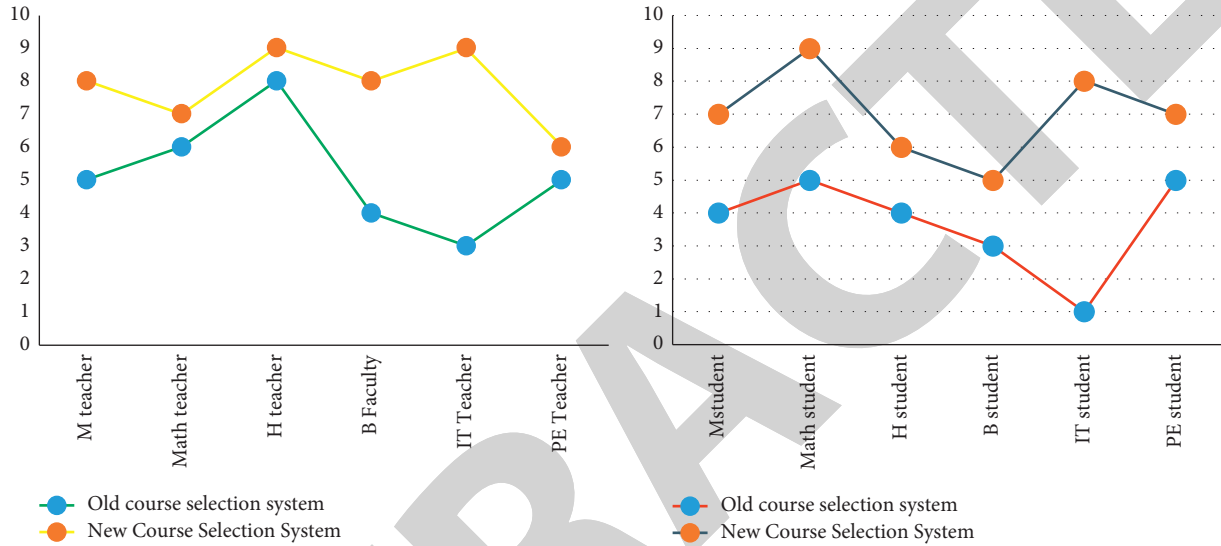


FIGURE 5: The evaluation chart of school teachers and students on the course selection system before and after the improvement.

TABLE 5: Test storage table structure.

Property Chinese name	Attribute name	Type	Length	Illustrate
Question number	Id	Int	100	Primary key
Question type	Type	Int	200	
Question difficulty	Level	Varchar	500	
Question content	Question	Varchar	500	
Correct answer	Rightanswer	Varchar	600	
Knowledge points	knowledgeIds	Id collection	100	
Visits	Visit	Number	100	

4. Discussion

This paper is dedicated to the research of AI and computer technology and applies it to modern intelligent teaching systems. Based on the original teaching system design, an intelligent teaching system is designed and implemented to assist modern digital teaching; students are the foundation and core of the intelligent and personalized service of the intelligent teaching system. This paper mainly focuses on modeling techniques such as learning interest, learning style, student cognitive ability, and student knowledge mastery and puts forward one of the above focus points. Through the analysis of the paper, the demonstration stage confirmed the

powerful advantages and functions of AI and computer technology in modern intelligent teaching systems.

Through the analysis and demonstration of the case in this paper, it can be known that the intelligent teaching system based on AI and computer technology not only is more scientific and effective than the original teaching system but also provides more personalized services to ShenYang University students. The innovation of the intelligent teaching system is a brand-new educational reform, especially in the current period of the new crown epidemic, which enables students to no longer be restricted by geographical areas, and can enter the system at any time to choose the content that they are interested in or have not

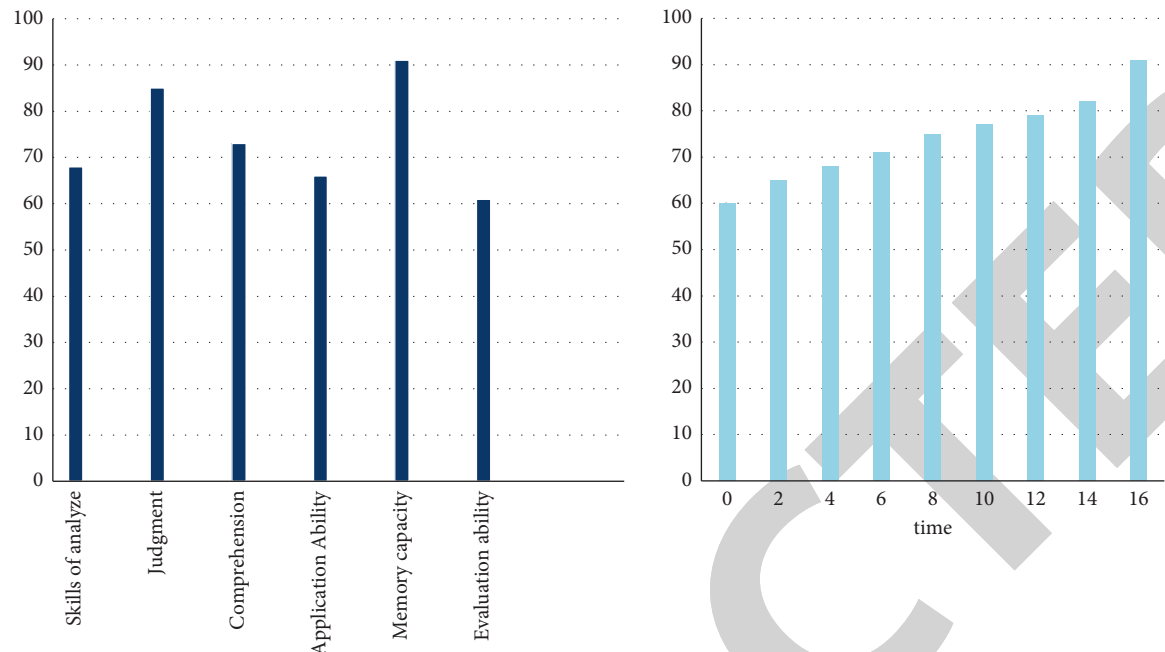


FIGURE 6: The effect of student learning performance.

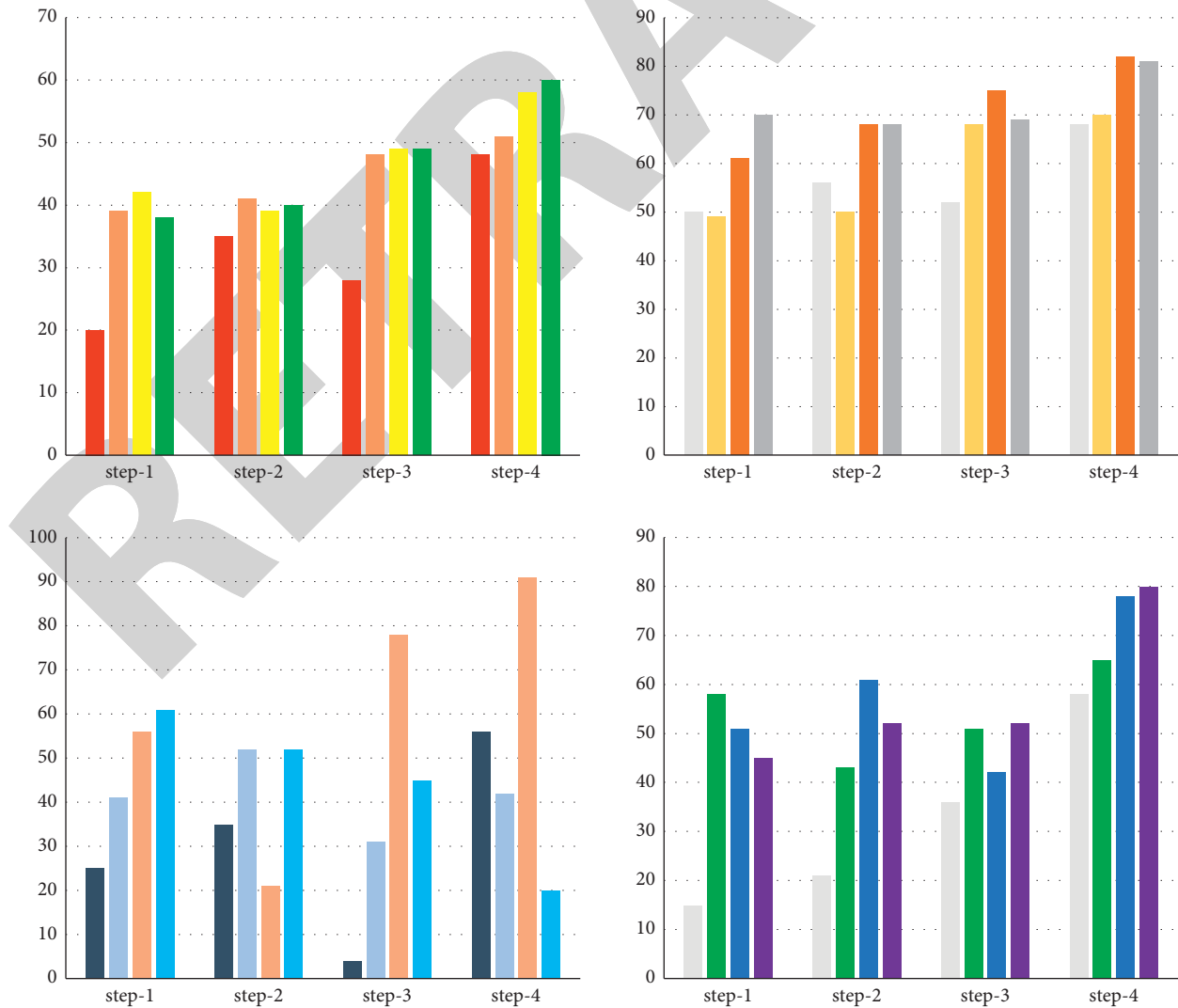


FIGURE 7: Comparison and improvement of the combined model and other models.

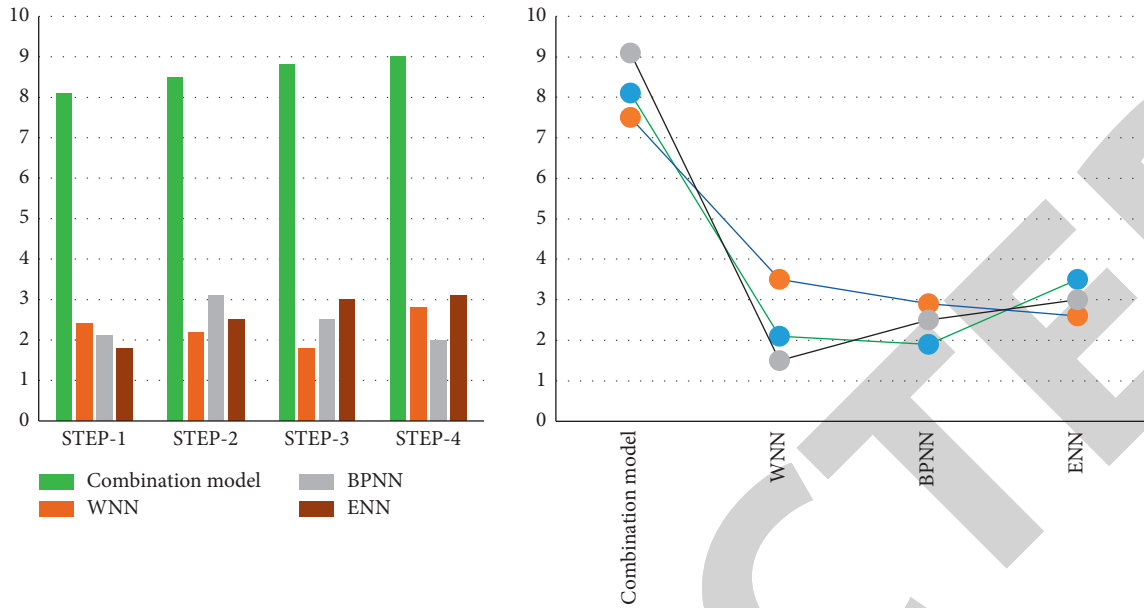


FIGURE 8: DM test results of each model and combined model.



FIGURE 9: Part of the interface diagram of a teaching system.

TABLE 6: Survey of users' preference for intelligent teaching systems.

	Difference	Generally	Good	Very satisfied
Student	20	56	81	92
Teacher	13	58	90	85
Administrator	15	36	86	69

mastered in the course. Relearning improves students' interest and attention so that the learning efficiency is greatly improved. At the same time, as a manager, the school can enter the system at any time and change the

original teaching plan and content at any time according to the students' learning situation, helping ShenYang University students to maximize the utilization of time during their school.

5. Conclusions

The case in this paper is based on the online course selection system of a certain school and the opinions of teachers and students on the intelligent teaching system. The research content firstly analyzes and introduces the modern intelligent online course selection system, and then through the survey of teachers and students, the online course selection system based on AI and computer technology has been favored by more than 60% of teachers and students. Then use the intelligent teaching system based on AI and computer technology to conduct a favorite survey. The survey results show that the modern intelligent teaching system is deeply liked by teachers and students, but some teachers and students are still not satisfied with the intelligent teaching system. It shows that the system still needs to be improved and perfected more. This also shows that the research in this paper is still insufficient, and more innovation in the research methods is still needed.

Data Availability

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

Conflicts of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this paper.

References

- [1] S. Ivanaj, G. B. Nganmini, and A. Antoine, "Measuring E-learners' perceptions of service quality," *Journal of Organizational and End User Computing*, vol. 31, no. 2, pp. 83–104, 2019.
- [2] K. Y. Chau, K. M. Y. Law, and Y. M. Tang, "Impact of self-directed learning and educational technology readiness on synchronous E-learning," *Journal of Organizational and End User Computing*, vol. 33, no. 6, pp. 1–20, 2021.
- [3] D. Tien Bui, Q.-T. Bui, and Q.-P. Nguyen, "A hybrid AI approach using GIS-based neural-fuzzy inference system and particle swarm optimization for forest fire susceptibility modeling at a tropical area," *Agricultural and Forest Meteorology*, vol. 233, pp. 32–44, 2017.
- [4] D. L. Labovitz, L. Shafner, M. Reyes Gil, D. Virmani, and A. Hanina, "Using artificial intelligence to reduce the risk of nonadherence in patients on anticoagulation therapy," *Stroke*, vol. 48, no. 5, pp. 1416–1419, 2017.
- [5] M. J. Timms, "Letting artificial intelligence in education out of the box: educational cobots and smart classrooms," *International Journal of Artificial Intelligence in Education*, vol. 26, no. 2, pp. 701–712, 2016.
- [6] E. Burton, J. Goldsmith, S. Koenig, B. Kuipers, N. Mattei, and T. Walsh, "Ethical considerations in artificial intelligence courses," *AI Magazine*, vol. 38, no. 2, pp. 22–34, 2017.
- [7] R. Chatila, K. Firth-Butterfield, J. C. Havens, and K. Karachalios, "The IEEE global initiative for ethical considerations in artificial intelligence and autonomous systems [standards]," *IEEE Robotics and Automation Magazine*, vol. 24, no. 1, p. 110, 2017.
- [8] A. Craswell, L. Moxham, and M. Broadbent, "Does use of computer technology for perinatal data collection influence data quality?" *Health Informatics Journal*, vol. 22, no. 2, pp. 293–303, 2016.
- [9] L. Wu, "Student model construction of intelligent teaching system based on Bayesian network," *Personal and Ubiquitous Computing*, vol. 24, no. 3, pp. 419–428, 2020.
- [10] W. Gong, L. Tong, W. Huang, and S. Wang, "The optimization of intelligent long-distance multimedia sports teaching system for IOT," *Cognitive Systems Research*, vol. 52, no. DEC, pp. 678–684, 2018.
- [11] C. A. Tavera Romero, J. H. Ortiz, O. I. Khalaf, and W. Montilla Ortega, "Software architecture for planning educational scenarios by applying an agile methodology," *International Journal of Emerging Technologies in Learning (iJET)*, vol. 16, no. 8, pp. 132–144, 2021.
- [12] J. Y. Hong, H. Ko, L. Mesicek, and M. B. Song, "Cultural intelligence as education contents: exploring the pedagogical aspects of effective functioning in higher education," *Concurrency and Computation Practice and Experience*, vol. 33, 2019.
- [13] J. Su, Y. Feng, and L. Liu, "Research on the influence of computer aided intelligent tutoring system on teacher's self-efficacy," *Journal of Intelligent and Fuzzy Systems*, vol. 35, no. 3, pp. 2749–2759, 2018.
- [14] A. Richard and Hudiburg, "Factor analysis of the computer technology hassles scale," *Psychological Reports*, vol. 71, no. 7, pp. 739–744, 1992.
- [15] S. Aithal, "An innovative education model to realize ideal education system," *International Journal of Scientific Research & Management Studies*, vol. 3, no. 3, pp. 2464–2469, 2016.
- [16] A. Pešikan and I. Ivić, "The sources of inequity in the education system of Serbia and how to combat them," *Center for Educational Policy Studies Journal*, vol. 6, no. 2, pp. 101–124, 2016.
- [17] L. D. Raedt, K. Kersting, S. Natarajan, and D. Poole, "Statistical relational artificial intelligence: logic, probability, and computation," *Synthesis Lectures on Artificial Intelligence and Machine Learning*, vol. 10, no. 2, pp. 1–189, 2016.
- [18] S. Aithal, "Relevance of on-line office administration through working from home in future education system," *Social Science Electronic Publishing*, vol. 22, no. 3, pp. 10–16, 2016.
- [19] D. Hassabis, D. Kumaran, C. Summerfield, and M. Botvinick, "Neuroscience-inspired artificial intelligence," *Neuron*, vol. 95, no. 2, pp. 245–258, 2017.
- [20] Z. Abdullah and N. A. Shukor, "Challenges in integrating BLOSSOMS in Malaysia's STEM education system," *Systems Research and Behavioral Science*, vol. 34, no. 3, pp. 304–306, 2017.
- [21] H. G. Orhan-Karsak, "Reflections of the changing education system according to the views of school managers: Turkey sample," *Universal Journal of Educational Research*, vol. 5, no. 8, pp. 1308–1322, 2017.
- [22] J. Avis, "India: preparation for the world of work: education system and school to work transition," *Journal of Vocational Education and Training*, vol. 68, no. 4, pp. 472–474, 2016.
- [23] B. Liu, "Computer network information security protection strategy based on clustering algorithms," *Advances in Intelligent Systems and Computing*, vol. 1146, pp. 3–10, 2020.
- [24] W. Miao, "Network communication security program design based on wireless router," in *Proceedings of the the International Conference on Cyber Security Intelligence and Analytics, CSIA 2020: Cyber Security Intelligence and Analytics*, pp. 11–17, Shenyang, China, March 2020.