



The Construction of English Teaching Platform Based on Artificial Intelligence Under Computer-Aided Design

Chen Xie^{1,*} and Haifei Yu²

¹Department of Business, Xinyang Vocational and Technical College, Xinyang, Henan 464000, China, xiechen@xyvtc.edu.cn

²Aviation Maintenance NCO Academy, Air Force Engineering University, Xinyang, Henan 464000, China, haifeiy@163.com

Corresponding author: Chen Xie, xiechen@xyvtc.edu.cn

Abstract. It breaks the traditional information model and quickly penetrates into various fields. In many aspects. First, it is the creation of an intelligent learning platform to create a more ideal environment for students to learn English. Second, it is the arrangement and provision of high-quality learning resources to provide more support for students. Targeted teaching plans are formulated according to the characteristics of students, effective learning methods are selected, and real-time analysis of students' learning conditions is carried out by intelligent means, which is flexible and flexible. Adjust the higher vocational English teaching plan. The teaching in college English classrooms in the era of artificial intelligence. Including being familiar with insisting on the unity and synergy of multimodal teaching meaning and form at the content level; effectively using language and non-language, Optimize the learning experience at the multimodal media level. On this basis, the analysis of teaching function requirements is carried out, and the teaching function requirements of assistants are determined based on the concept of "human-machine collaboration" and the teaching behavior of teachers. At the same time, try not to involve Java script; realize the normal operation of Struts application through steps such as copying files and adding elements, so as to ensure that the system can conduct English vocabulary query smoothly. The resource library and the test question resource library are constructed. The rational design of the vocabulary resource is the basis for personalized vocabulary recommendation.

Keywords: CAD; Artificial Intelligence; English Teaching Platform.

DOI: <https://doi.org/10.14733/cadaps.2023.S5.168-179>

1 INTRODUCTION

Every change in education is inseparable from the application of technology. Due to its huge advantages in education precision, intelligence and personalization, artificial intelligence

technology is regarded as a breakthrough in education reform and transformation at this stage by governments of various countries [1]. Overall planning and practice leadership [2]. It proposed to implement artificial intelligence education, promote artificial intelligence courses, and cultivate artificial intelligence professionals. Since then, developed countries such as the United Kingdom, France, and Singapore have successively introduced such plans [3]. To sum up, they have the following common points in the education level, actively carry out artificial intelligence education, open systematic artificial intelligence courses, and actively cultivate and introduce artificial intelligence talents [4]. The Chinese government also attaches great importance to the development of artificial intelligence technology in the field of education, and has successively issued a series of policies to promote the application of artificial intelligence technology in the field of education [5]. Jagannath et al. [6] emphasizes the need to vigorously cultivate and introduce AI professionals and set up AI courses. Learning requires repeated review and study, so that memory is not easy to forget. Liang et al. [7] believes that if there is no scientific memory method, it is easy to give up learning, and it is difficult to master the knowledge learned for a long time. This is why the word "software" in the market is mainly used for sudden learning and rarely used by everyone for a long time [8].

Paek and Kim [9] believes that this kind of intelligent technology will bring about thorough changes in education methods, education environment, education evaluation system and talent training mode. Rogers and Weatherby [10] believe that with the reform of teaching mode, educational environment and talent training mode, as well as the continuous development of artificial intelligence technology. As the integration of artificial intelligence and education will gradually deepen, Su [11] has carried out a relatively extensive integration from all disciplines to a detailed integration of professional disciplines. With the application of AI in English teaching evaluation and Viscaino et al. [12] analysis of teaching collaboration, etc. The evaluation method and teaching method of English subject are also changing gradually. Artificial intelligence technology has gradually entered English classroom teaching and performance assessment. The application of these technologies not only improves teaching efficiency, but also optimizes students' learning experience.

At present, in many areas of our country, in the examinations such as the primary listening and speaking examinations of English subjects have been adopted or planned to adopt the form of computer-based examinations in the next few years, and the examinations are conducted by means of human-computer dialogue. As early as 2009, Jiangsu Province implemented the "automatic test" the whole province, that is, the form of man-machine dialogue. The implementation of "automatic test" has realized the automatic test and evaluation process. In 2015, the "Implementation Measures for the Evaluation of Academic Level of Students in Secondary Vocational Schools in Shanghai" (hereinafter referred to as the "Implementation Measures") was issued by the Shanghai Municipal Education Commission. carry out.

Since then, Shandong, Guangxi, Beijing and other provinces and cities have successively issued guiding documents to promote the computer-based test of English listening and speaking, and conduct man-machine dialogue. Changes in assessment methods will inevitably lead to changes in education methods. In order for students to achieve good results in automated exams, it is necessary to introduce machine dialogue in daily teaching to create a language environment and conduct dialogue exercises, so that students can learn in daily life. Learn about machine conversations and scoring features.

2 RELATED CONCEPTS AND THEORETICAL BASIS

2.1 Constructivist Learning Theory

The key to the current teaching reform in schools at all levels at home and abroad is whether it can break the traditional teaching mode. This kind of teaching mode featuring "teacher-centered, teacher-speaking, students-listening" is it conducive to cultivating cultivating innovative thinking.

Spiritual and practical talents. It is over the years. Theoretical research results. Such constructivist learning theory is showing more and more that it is closely related to individual cognitive development and learning process. Knowing the rules. It breaks the traditional information model and quickly penetrates into various fields. In many aspects. First, it is the creation of an intelligent learning platform to create a more ideal environment.

"Learning" and "learning methods" (that is, about "how to learn") are explained.

The meaning of learning: At the same time, script; realize the normal operation of Struts application through steps such as copying files and adding elements, so as to ensure that the vocabulary learning resources are divided into thirteen categories. Finally, according to the English vocabulary resources According to the construction principle of the library, the vocabulary resource library and the test question resource library are constructed. The rational design of the vocabulary resource is the basis for personalized vocabulary recommendation.

(2) About the method of learning

A. Understanding the Memory Method

To be memorized on the basis of not seeking much understanding. And rote memorization of this method, although memorized to remember, but this is only a short period of memory, a short period of time will be forgotten, when reciting an article or a paragraph, first of all to read through the whole text, to find out the main idea of the article, and that play a role in the relationship, through first analysis, then synthesis, so that the recitation is much faster. Memorization should also be based on the text, such as reciting an argumentative essay, which can start from analyzing arguments, arguments, and arguments; Memorizing narratives can start from understanding and mastering the relevant facts and the order of narration.

B. Quick recitation

Memorization is necessary to read it repeatedly, and then repeat the silent reading.

That is, the process of communication and discussion) in collaborative learning, discussion and debate. On the contrary, it is it every day, so that short-term memory becomes a permanent memory.

2.2 Artificial Intelligence

(1) The concept of artificial intelligence

Artificial intelligence emerged in the middle of the 20th century. This course belongs to computer science, but it also includes informatics, language, psychology and other disciplines, and has a strong comprehensive type. The core system of artificial intelligence is a computer, which simulates human thinking activities with the help of computer systems. The research field of this subject is very broad and has been applied in many aspects. Because the field of artificial intelligence research is very broad, it is very challenging. At present, artificial intelligence research is closely related to human needs. Therefore, artificial intelligence technology will also change with the development and changes of society, so that the advantages and functions of this technology can be better played. The fundamental and "understand language".

(2) Artificial intelligence technical characteristics

Artificial intelligence has strong search ability, knowledge understanding and expression ability, thrust computing ability, leisure expression ability, speech recognition ability and so on. Based on these characteristics of artificial intelligence technology, it can simply simulate the way of human thinking.

2.3 Computer-Assisted Teaching

(1) The concept of computer-aided teaching

The computer-aided teaching function can increase the opportunities for students to exercise, use computer functions flexibly, and simulate the experimental teaching process. Computer-aided

teaching is mainly completed through courseware. Students can study in a targeted manner according to their own conditions, thereby enhancing their own learning ability and improving the effectiveness of classroom teaching.

(2) Problems in Computer Assisted Teaching

It is insufficient. It mainly uses various carriers to present the corresponding learning content. The process is mechanical, and students do not complete conscious and active learning. At the same time, without the supervision and management of teachers, some students may become lazy, and when students encounter problems, they cannot get the answers immediately. In classroom teaching, teachers can more comprehensively understand the actual situation of students in all aspects, and the use of computer-aided teaching only achieves exquisite teaching courseware, and the teaching form is relatively simple, and it is impossible to change the teaching mode according to the emotional state of students. It is a problem that we must think and solve in computer-aided teaching.

(3) The relationship between artificial intelligence and computer-aided teaching

Intelligence includes both human and computer intelligence. The use of artificial intelligence can transform human intelligence into computer intelligence; the same use of computer intelligence teaching can also transform computer intelligence into human intelligence. Through human intelligence, knowledge can be fully expressed, which is a form of knowledge expression; through computer intelligence, knowledge reasoning and proof can be completed, that is, knowledge intelligence and automatic processing.

It can effectively bring out the interactive features of computer-aided teaching and accelerate the pace of software intelligence research. But from the current situation, AI technology has not really been involved in the computer-aided teaching system. To build a real intelligent teaching system, experts and scholars need to continue to study and explore. The relationship between artificial intelligence and computer-aided teaching can be represented by the following relationship diagram (Figure 1).

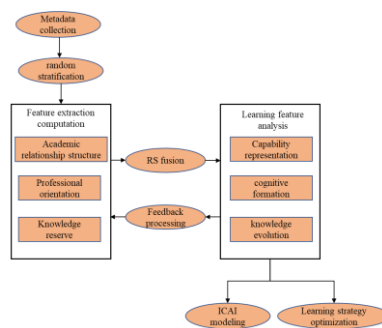


Figure 1: The relationship between artificial intelligence and computer-aided teaching.

3 RELATED TECHNOLOGIES

3.1 Data Mining Utility of Computer-Aided Teaching System

Use a BP (Back Propagation), layer. This paper uses it to mine students' learning level and cognitive ability, and obtain their mastery of knowledge points. Among them, the input corresponds one-to-one with the degree of resource learning and the degree of understanding of knowledge points, and the hidden layers are in the form of fully interconnected connections.

Using Bloom's goal classification strategy, students' cognitive ability is divided into 6 grades, and the input items $X = \{X_1, X_2, \dots, X_n\}$ are set as the evaluation value of cognitive ability, homework, test results and learning efficiency. Wait Multiple variables, the output $Y = \{Y_1, Y_2, Y_3\}$ is the student's mastery of concepts, skills, and applications. Assuming that the number of variables is n , the quantitative expression of the nonlinear mapping of the understanding degree of any knowledge point from n -dimensional to three-dimensional space is as follows:

$$\begin{cases} F_{bp} : X \rightarrow Y \\ X = \{X_1, X_2, \dots, X_n\} \\ Y = \{Y_1, Y_2, Y_3\} \end{cases} \quad (1)$$

In the formula, the evaluation values of the six levels of cognitive ability are X_1 - X_6 , and the information such as homework and examinations are X_7 - X_n .

Assuming that the input item is the data set L_i , the number of objects contained is 1, the output item is the cluster center Z_j and the corresponding cluster data set C_j , and the number of clusters is K , the flow of the student learning feature classification algorithm is described as follows.

(1) Initialize the cluster center Z_j .

(2) Use formula (2) to solve the distance between the data and the center:

$$D(L_i, Z_j) = |L_i - Z_j| \quad (2)$$

Among them, $i=1,2,\dots,l, j=1,2,\dots,k$.

(3) When the distance $D(L_i, Z_j)$ satisfies the following equation, there is $L_i \in C_j$, and the classification is performed:

$$D(L_i, Z_j) = \min \{D(L_i, Z_j)\} \quad (3)$$

(4) If $l=1$, then there are the following expressions: The teaching in college English classrooms in the era of artificial intelligence. Including being familiar with insisting on the unity and synergy of multimodal teaching meaning and form at the content level; effectively using language and non-language, Optimize the learning experience at the multimodal media level.

$$J_c(l) = \sum k_j = 1 |L_i - Z_j|^2 \quad (4)$$

When the following equations hold, the cluster centers need to be reset and go back to the first step for reclassification:

$$Z_j = \frac{\sum_{i=1}^l (L_i)^j}{l} \quad (5)$$

The computer-aided interface module, teaching subsystem, teaching rule base, student information base, and teaching resource base. The specific structure is shown in Figure 2. The key module subsystem, which consists of the preprocessing and collection of user data, data analysis, and information scheduling.

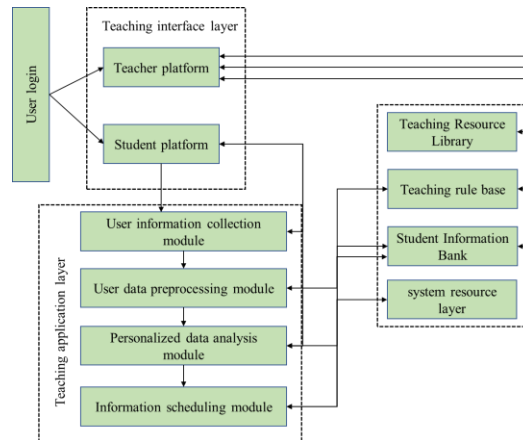


Figure 2: The overall frame diagram of the computer-aided teaching system for English courses.

It is as follows:

$$U = \sum_{i=1}^d \sum_{p \in C_i} |p - b_i|^2 \quad (6)$$

The process, Rs is used to represent the sample. For each Rs, the nearest cluster center needs to be determined. It is represented by R_i ($0 \leq i \leq d - 1$), and the i , Rs key-value pair is obtained. In the Map Reduce aggregated samples:

$$R_i = \sum_{j=1}^n R_j / n \quad (7)$$

After a round of Map Reduce is completed. On this basis, the analysis of teaching function requirements is carried out, and the teaching function requirements of assistants are determined based on the concept of "human-machine collaboration" and the teaching behavior of teachers. At the same time, try not to involve Java script; realize the normal operation of Struts application through steps such as copying files and adding elements, so as to ensure that the system can conduct English vocabulary query smoothly. The resource library and the test question resource library are constructed. The rational design of the vocabulary resource is the basis for personalized vocabulary recommendation.

To really understand them you have to put the words into the corresponding context. This requires learners to learn and consolidate words as they read. It turns out that vocabulary learned in context is more memorable than mere memorization. The improvement of English vocabulary and reading ability go hand in hand. However, if you look up words too frequently during reading, it will not only affect the reading speed, but also affect reading comprehension and mastery of new words if the interpretation of the dictionary you look up does not match the meaning of the words in the original text. the vocabulary learning resources are divided into thirteen categories.

3.2 Software Design

The data achievement includes the internal school and the external information of the school. The school's internal information includes student information, test scores, etc.; external information refers to various teaching resources, data sources and other information, which are embedded in the data source integration part. These massive and scattered data information needs to be classified according to certain standards and migrated to a central storage station. These categories of information need to be expressed in functional form, as follows:

$$D = \begin{bmatrix} d_{11} & d_{12} & \cdots & d_{1m} \\ d_{21} & d_{22} & \cdots & d_{2m} \\ \vdots & \vdots & \ddots & \vdots \\ d_{n1} & d_{n2} & \cdots & d_{nm} \end{bmatrix} \quad (8)$$

Let n teaching objects be set $X = \{x_1, x_2, \dots, x_n\}$, select m teaching indicators as set $Y = \{y_1, y_2, \dots, y_m\}$, teaching result $D = f(W)$, where $W = \{w_1, w_2, \dots, w_m\}$, which represents the weight coefficient of each indicator, so that the massive information can be sorted and classified under the action of the function. In order to transmit the classified information, BP neural network needs to be introduced into the software design. It gradually speeds up the you need to review it every day, so that short-term memory becomes a permanent memory.

It is mainly created by the interaction channel. The input content is the event that affects the neuron. The activation its expression is:

$$\text{net} = x_1 w_1 + x_2 w_2 + \cdots + x_n w_n \quad (9)$$

In the formula: connection weight value. These neurons are then transmitted to the hidden layer, which mainly includes the core of data processing, and its function is to system itself. The formula for the number of hidden layers is:

$$n_H = \sqrt{0.43nm + 2.54m + 0.12n + 0.35} + 0.51 \quad (10)$$

It represents the number of hidden layers.

3.3 Mathematical Model of Principal Component Analysis

With n samples, each sample observes p items of indicators (variables): X_1, X_2, \dots, X_p , to obtain the original data array:

$$X = \begin{bmatrix} X_1 & X_2 & \cdots & X_p \\ X_{11} & X_{12} & \cdots & X_{1p} \\ X_{21} & X_{22} & \cdots & X_{2p} \\ \vdots & \vdots & & \vdots \\ X_{n1} & X_{n2} & \cdots & X_{np} \end{bmatrix}_{n \times p} \quad (11)$$

Orthogonal transformation is performed on p index vectors X_1, X_2, \dots, X_p , that is, there is a system of linear equations:

$$\begin{cases} Y_1 = a_{11} X_1 + a_{21} X_2 + \cdots + a_{p1} X_p \\ Y_2 = a_{12} X_1 + a_{22} X_2 + \cdots + a_{p2} X_p \\ \dots \\ Y_p = a_{1p} X_1 + a_{2p} X_2 + \cdots + a_{pp} X_p \end{cases} \quad (12)$$

abbreviated as

$$Y_i = a_{1i} X_1 + a_{2i} X_2 + \cdots + a_{pi} X_p \quad (13)$$

Y_1, Y_2, \dots, Y_{p-1} . In fact, for the following optimization model:

$$\begin{cases} G \cdot a_1 = \lambda a_1 \\ a_1^T \cdot a_1 = 1 \end{cases} \quad (14)$$

When solving practical problems, generally, instead of taking p principal components, the first k are taken. Their difficulties are mainly caused by insufficient vocabulary. Chinese students' learning habits of English words are often "meaning-driven", and learners usually only expand their vocabulary by memorizing word forms and Chinese explanations, ignoring the understanding of word application scenarios, and ignoring the development of vocabulary knowledge to depth. The current English vocabulary learning methods mainly include: memorizing vocabulary books, computer software learning and mobile. Learning requires repeated review of learning, so that memory is not easy to forget. If there is no scientific memory method, it is easy to give up learning, and it is difficult to master the knowledge learned for a long time.

$$\sum_{i=1}^k \lambda_i / \sum_{i=1}^p \lambda_i, \quad k = 1, \dots, p \quad (15)$$

Generally speaking, application of Problem analysis and research.

4 EXPERIMENTAL RESULTS AND ANALYSIS

4.1 Simulation Experiment

The experimental environment adopts the Simu works platform, and the server side and the database design auxiliary tool use SAP HANA. The OS used on the server side is Microsoft Windows XP/SP2.

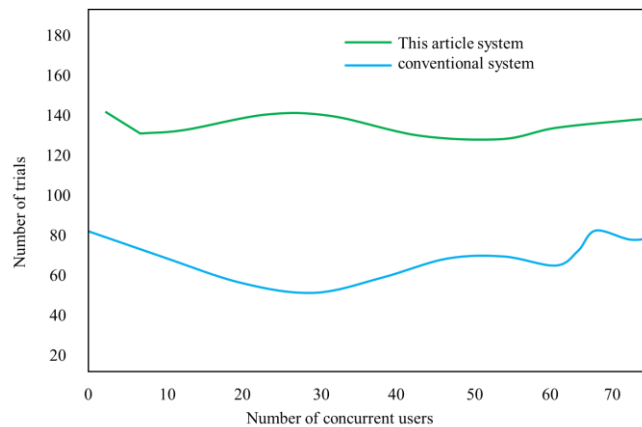


Figure 3: User Concurrency Test Results.

As can be seen from Figure 3, the average number of concurrent users using the system in this paper is 131, and the average number of concurrent users in the conventional system is 73. It shows that the system performance of this paper is better.

Using the Simu works platform, in the experimental environment described, the information retrieval time test was carried out on the conventional computer-aided classroom teaching system and the system designed in this paper, and the experimental results were drawn as a graph, and the results are shown in Figure 4.

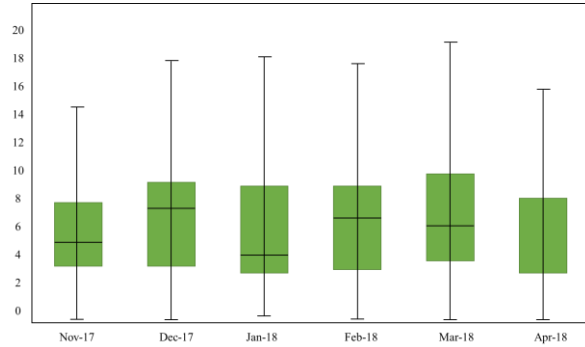


Figure 4: Information retrieval time test results.

The mining-based teaching system. The effectiveness of computer-assisted classroom teaching systems. Their difficulties are mainly caused by insufficient vocabulary. Chinese students' learning habits of English words are often "meaning-driven", and learners usually only expand their vocabulary by memorizing word forms and Chinese explanations, ignoring the understanding of word application scenarios, and ignoring the development of vocabulary knowledge to depth. The current English vocabulary learning methods mainly include: memorizing vocabulary books, computer software learning and mobile. Learning requires repeated review of learning, so that memory is not easy to forget. If there is no scientific memory method, it is easy to give up learning, and it is difficult to master the knowledge learned for a long time. This is why the word software on the mark.

4.2 Comparison of Teaching Effects

with 62 students in each group, taught by a teacher. The average grades at the end of the term were compared between the control group and the experimental group. The data is depicted in a column chart, and the results are shown in Figure 5.

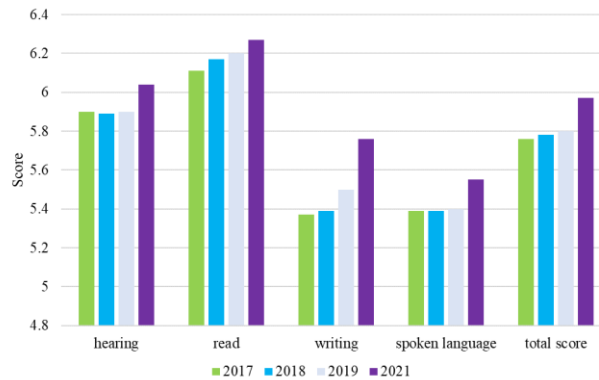


Figure 5: Comparison of the number of people in each score segment between the two groups total.

The experimental results show that in this final exam, the students who use the system in this paper have significantly higher scores than those who do not use the system in this paper, which shows that the system in this paper can effectively improve their academic performance.

The experiment is to test the resource occupancy and memory occupancy of the system in this paper, the auxiliary classroom teaching system based on mobile terminals and the C/S multimedia auxiliary classroom human-computer interaction, information collection, and information preprocessing. rate, and the results are shown in Figure 6.

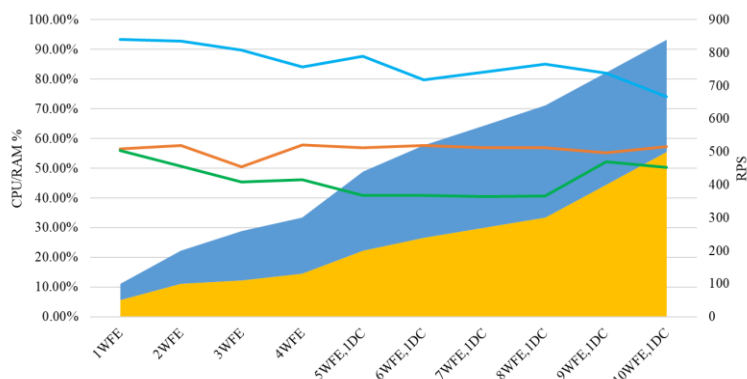


Figure 6: Comparison of the resource occupancy rate of each auxiliary classroom teaching system %.

Analysis of Figure 6 shows that the total CPU occupancy rate of the system in this paper is 35.7%, which is 50.8% and 37.7% lower than the other two systems respectively; the total memory occupancy rate of the system in this paper is 18.6%, Compared with the other two systems, it is reduced by 51.8% and 32.4%, respectively. The experimental results show that the resource occupancy rate is low when using the system in this paper for computer-aided teaching. Chinese students have studied English, and only 3% of them can read English periodicals and books without barriers. Their difficulties are mainly caused by insufficient vocabulary. Chinese students' learning habits of English words are often "meaning-driven", and learners usually only expand their vocabulary by memorizing word forms and Chinese explanations, ignoring the understanding of word application scenarios, and ignoring the development of vocabulary knowledge to depth. The current English vocabulary learning methods mainly include: memorizing vocabulary books, computer software learning and mobile. Learning requires repeated review of learning, so that memory is not easy to forget. If there is no scientific memory method, it is easy to give up learning, and it is difficult to master the knowledge learned for a long time. This is why the word software on the market is mostly used for sudden learning, and is rarely used by everyone for a long time.

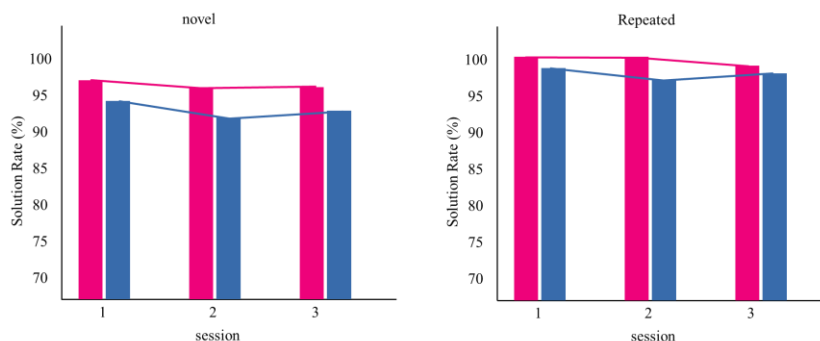


Figure 7: Comparison of comprehensive ability scores of students before and after intervention.

The results of this study are shown in Figure 7. The scores of the students after the intervention mode can effectively improve students' critical thinking ability, enhance their comprehensive ability, and improve their satisfaction with the effect of teaching activities.

5 CONCLUSION

In summary, researchers have tried to get students out of the process of "tutored learning" to acquire new knowledge and improve classroom teaching efficiency. From other aspects of teaching, artificial intelligence technology can also build human reasoning models to facilitate better learning for students. Such widespread use of virtual reality technology, computer-aided teaching has become more complete. This paper of data mining is 58 higher than that of the conventional teaching system, and the information retrieval time is 0.72 s faster than that of the conventional teaching system. The effectiveness is this. Chinese students' learning habits of English words are often "meaning-driven", and learners usually only expand their vocabulary by memorizing word forms and Chinese explanations, ignoring the understanding of word application scenarios, and ignoring the development of vocabulary knowledge to depth. The current English vocabulary learning methods mainly include: memorizing vocabulary books, computer software learning and mobile APP learning.

Chen Xie, <https://orcid.org/0000-0002-9436-8505>

Haifei Yu, <https://orcid.org/0000-0003-2751-4434>

REFERENCES

- [1] Allen, B.; Stephen, M.-G.: DevlinMarie. toward a framework for teaching artificial intelligence to a higher education audience, *ACM Transactions on Computing Education (TOCE)*, 37(22), 2021, 166-168. <https://doi.org/10.1145/3485062>
- [2] Han, Y.: Evaluation of English online teaching based on remote supervision algorithms and deep learning, *Journal of Intelligent & Fuzzy Systems*, 40(4), 2021, 7097-7108. <https://doi.org/10.3233/JIFS-189539>
- [3] Xie, H.-Y.; Qiang, M.: College English cross-cultural teaching based on cloud computing MOOC platform and artificial intelligence, *Journal of Intelligent & Fuzzy Systems*, 40(4), 2021, 7335-7345. <https://doi.org/10.3233/JIFS-189558>
- [4] Hwang, G.-J.; Tu, Y.-F.: Roles and research trends of artificial intelligence in mathematics education: A bibliometric mapping analysis and systematic review, *Mathematics*, 9(6), 2021, 584. <https://doi.org/10.3390/math9060584>
- [5] Iphofen, R.; Kritikos, M.: Regulating artificial intelligence and robotics: ethics by design in a digital society, *Contemporary Social Science*, 16(2), 2021, 170-184. <https://doi.org/10.1080/21582041.2018.1563803>
- [6] Jagannath, A.; Jagannath, J.; Melodia, T.: Redefining wireless communication for 6G: Signal processing meets deep learning with deep unfolding, *IEEE Transactions on Artificial Intelligence*, 2(6), 2021, 528-536. <https://doi.org/10.1109/TAI.2021.3108129>
- [7] Liang, X.; Haiping, L.; Liu, J.; Lin, L.: Reform of English interactive teaching mode based on cloud computing artificial intelligence—a practice analysis, *Journal of Intelligent & Fuzzy Systems*, 40(2), 2021, 3617-3629. <https://doi.org/10.3233/JIFS-189397>
- [8] Lisowski, J.: Synthesis of a path-planning algorithm for autonomous robots moving in a game environment during collision avoidance, *Electronics*, 10(6), 2021, 675. <https://doi.org/10.3390/electronics10060675>
- [9] Paek, S.; Kim, N.: Analysis of worldwide research trends on the impact of artificial intelligence in education, *Sustainability*, 13(14), 2021, 7941. <https://doi.org/10.3390/su13147941>

- [10] Rogers, E.; Weatherby, K.: Developing little bridge as an evidence-informed English language learning platform for 6–12 year olds, *Research for All*, 5(1), 2021, 73-84. <https://doi.org/10.14324/RFA.05.1.06>
- [11] Su, K.-D.: Implementation of innovative artificial intelligence cognitions with problem-based learning guided tasks to enhance students' performance in science, *Journal of Baltic Science Education*, 21(2), 2022, 245. <https://doi.org/10.33225/jbse/22.21.245>
- [12] Viscaino, M.; Bustos, J.-T.; Muñoz, P.; Cheein, C.-A.; Cheein, F.-A.: Artificial intelligence for the early detection of colorectal cancer: A comprehensive review of its advantages and misconceptions, *World Journal of Gastroenterology*, 27(38), 2021, 6399. <https://doi.org/10.3748/wjg.v27.i38.6399>