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Article

Data-driven Teaching Mode Innovation and Teaching Quality Improvement Strategies for English Education in Colleges and Universities

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Abstract: Combining the data era with the characteristics of teachers and students to innovate the teaching mode is an effective means to improve the quality of English education and teaching in colleges and universities. In this paper, under the guidance of modern teaching theory, in-depth study of the operation principle of the expert system in the field of artificial intelligence, to categorize and summarize the English knowledge points with its knowledge representation, and thus build the English teaching expert system in this paper. In the actual English teaching in a university, the experimental class A and the control class B, which have no significant difference in total scores, are selected to carry out the comparative experiments on the auxiliary effect of this expert system. The average value of a number of indexes of the experimental class that used the English teaching expert system of this paper changed a lot, and the degree of improvement was very significant ($P<0.01$ or $P<0.05$), which indicates that the English teaching expert system of this paper can effectively assist the English teaching of teachers and the English learning of students in colleges and universities, and improve the quality of English teaching while updating the form of education.

Keywords: modern teaching theory; expert system; college English education; knowledge representation

1. Introduction

With the deepening of China's education reform, the public's concept of education has changed greatly, and the importance of college education is increasing. For individual students, the university period is a key period for their ability development, and high-quality college education is of great significance for their future development, significantly affecting their future learning and development [1-4]. The arrival of the big data era has changed people's production and life patterns, and the massive amount of information has affected the ways and means of people's access to information resources, and the field of education has therefore encountered unprecedented opportunities and challenges [5-7]. Under the background of big data, the ways for students to acquire English knowledge are diversifying, and the attraction of traditional English teaching to students is weakening, however, colleges and universities still take the traditional education teaching mode as the “program”, which makes English teaching inevitably lagging behind, and it is difficult to guarantee the quality of English education [8-11]. In this regard, it is necessary to find new ways to develop English teaching in colleges and universities in the new era.

Although the concept of big data has been deeply rooted in people's hearts in recent years, from an

overall perspective, it seems that the idea of big data has not penetrated into English teaching in colleges and universities [12]. First of all, the utilization of big data by teachers and students in many colleges and universities is not scientific, and its effectiveness and advantages are difficult to be fully utilized, not to mention that it can't serve to improve the level of English teaching in colleges and universities [13-15]. Secondly, the traditional education and teaching mode is still the mainstream of education and teaching, educators' teaching ideas and teaching methods have not been innovated in a timely manner, and the indoctrination teaching mode and boring teaching content are difficult to inspire students to devote themselves to English learning [16-19]. At the same time, some educators do not pay attention to the practicality of English education in colleges and universities, education and teaching do not consider the actual needs of students' majors at all, English education lacks practical value, and it can not serve students' employment and work at all [20-22]. Therefore, developing a data-driven innovative education model of college English is conducive to breaking the time and space limitations of education and expanding the coverage of education to guarantee the effectiveness of teaching quality [23-25].

Informatization of the whole population is a development trend under the background of big data, under the influence of this trend, the English teaching mode should be in line with the trend of the times to ensure its strong attraction. As for the multimedia teaching mode, Juan, L. et al. use multimedia technology to design the text, images and other elements of the English course, so that students can stimulate a strong interest in English learning in the real language teaching environment created, and enhance students' knowledge comprehension and English learning efficiency [26]. Cheng, X. et al. designed a multimedia network-based practical business English teaching program to significantly improve students' practical English skills and thus achieve better English learning outcomes by providing internship opportunities, enriching teaching scenarios, and extending teaching hours [27]. Shu, Y. Integrating English multimedia-assisted teaching resources into the classroom teaching mode, using a variety of translation software and testing functions to optimize the learning process of students' English translation and grammar knowledge, and to improve their language awareness and language competence [28]. As for the microteaching mode, Lu, S. explored the application of microteaching on the basis of the characterization of English reading teaching, aiming to use educational informatization technology to promote the reform of the English teaching mode and to effectively improve the English reading level of students [29]. Lu, H. showed that the combination of college English teaching and microteaching is conducive to expanding students' international perspective, enriching teachers' teaching concepts and creating a relaxing and enjoyable teaching atmosphere, and that under the influence of the characteristic microteaching methods, students' English learning effect has been significantly improved [30]. Gao, J. et al. elucidated that as a new Internet-based teaching resource, the microteaching English teaching method effectively improves teachers' teaching ability, students' learning interest, and teacher-student relationship construction compared to traditional education forms, providing students and teachers with a broad English learning space [31]. Regarding the teaching mode of flipped classroom, Zhang, L. emphasized that English flipped classroom under cooperative learning mode is a teaching mode with high teaching efficiency, which not only can improve students' independent learning ability and communication ability, but also has positive effect on the cultivation of innovative thinking and team spirit [32]. Birová, L. based on a practical investigation found that incorporating flipped classroom teaching strategies in English language classrooms can effectively improve students' communicative competence in foreign languages [33]. Liu, Y. et al. constructed a teacher-student interaction evaluation model for oral teaching in English flipped classroom to analyze the influence of indicators such as emotional factors, teaching content, and students' interest on the effect of classroom interaction, and in this way, they enriched the knowledge system in the field of flipped classroom to provide theoretical support for the exploration of high-quality English teaching [34]. It can be seen that a large number of scholars have confirmed that a variety of educational and teaching methods, including multimedia teaching, microteaching, flipped classroom teaching and so on, can play a positive impact in increasing students' interest in learning, improving the effectiveness of education and teaching, and increasing students' participation in the classroom.

In addition, teaching modes such as distance education and intelligent network platform education can break through the strong dependence of education and teaching on time and space, and solve various problems encountered by students in the process of learning English in a timely manner. Herdina, G. G. H. et al. designed an artificial intelligence-based English learning system, iLearn, which is embedded in the English teaching classroom and can effectively recognize students' learning needs and help teachers understand students' learning status, promoting the development of high-quality English teaching classroom [35]. Han, C. explored the intelligent construction path of English education classroom in colleges and universities to optimize teaching strategies and improve the

learning environment under the influence of information technology, so that the English teaching mode can develop towards personalization, specialization, comprehensiveness and innovation [36]. He, Y. constructed an English multimedia network teaching resources integration system supported by cloud storage technology, using intelligent algorithms to extract the relevant features in the data of students' behavioral habits, realizing the cloud storage control of English teaching resources, and improving the quality of English teaching [37]. Wen, H. established an intelligent English recognition system based on support vector machines, which can quickly recognize the syllables and pronunciation of words in utterances, and used the learning platform to assist students' oral English practice, which played an important role in the improvement of students' oral English level [38]. Intelligent English teaching platform can provide English learners with better quality services, making it easier for students to feel success and fun in the process of English learning, and students' interest in English learning can be well stimulated as a result.

This paper firstly elaborates the modern teaching theory, takes the theory as the premise, introduces the expert system and discusses its working principle and design structure in depth, and builds a set of expert system suitable for English teaching by organizing the English knowledge points with its knowledge representation module and analyzing the students' learning situation by using its reasoning technology. The English teaching expert system of this paper is applied to the English teaching of an experimental class in a university, and two classes with no significant difference in total English scores are selected to carry out the experiment. The results and learning performance of the experimental class and the control class before and after the application of this paper's system are compared respectively to verify the superiority of this paper's system in English teaching in colleges and universities.

2. Expert System for Teaching English as a Foreign Language

Constructivism advocates student-centered learning under the guidance of the teacher, that is to say, both emphasize the role of the cognitive subject of the students, without neglecting the role of the teacher's guidance, the teacher is a helper and facilitator of the construction of meaning, rather than a transmitter of knowledge and indoctrinator. Students are the main body of information processing, is the active constructor of meaning, rather than the passive recipient of external stimuli and the object of indoctrination.

With the help of constructivist learning theory to guide the design of English expert system in colleges and universities is quite adaptable, the significance of which lies in the fact that the expert system is not used as a means or a method to help teachers to instill knowledge, but as a cognitive tool to help students to actively construct meaning.

2.1. Principles of Expert Systems

An expert system is a major application area of artificial intelligence, which is an intelligent computer system. It contains a large amount of knowledge and experience at the level of experts in a certain field, and is capable of applying the knowledge and problem-solving methods of human experts to deal with problems in that field.

(1) Knowledge base: It is used to store the specialized knowledge of an expert system in a certain field, including facts, feasible operations and rules. In order to solve the knowledge base, knowledge acquisition and knowledge representation are addressed. Knowledge acquisition involves the problem of how to obtain specialized knowledge from experts; knowledge representation solves the problem of how to express and store knowledge in a form that can be understood by computers.

(2) Reasoning machine: a program used to memorize the rules and control strategies used so that the entire expert system can work in a logical and coordinated manner. The reasoner should be able to reason and derive conclusions based on knowledge rather than simply searching for ready-made answers.

(3) Interpreter: Used to explain the behavior of the expert system to the user, including explaining the correctness of the reasoning conclusions and the reasons for exporting other candidate solutions.

(4) User interface: used to recognize and interpret the information provided by the user to the system such as commands, questions, and data, and to translate this information into an internal representation of the system. In addition, the interface also provides the user with the questions, results and explanations in a form that is easily understood by the user.

The simplified structure of the expert system is shown in Figure 1:

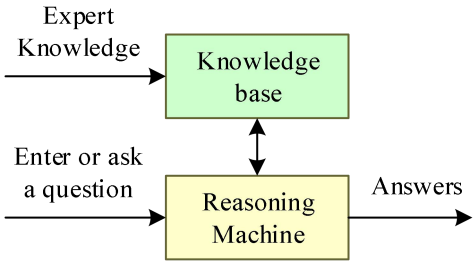


Figure 1. Simplified structure diagram of expert system

2.2. Knowledge representation

Knowledge representation is the process of symbolizing, formalizing and modeling knowledge, which is one of the key technologies in knowledge engineering. In an expert system, knowledge representation refers to the strategy of representing human knowledge into data structures and system control structures that can be processed by machines. The choice of knowledge representation model should not only consider the representation and storage of knowledge, but also the knowledge acquisition ability of the system and the efficiency of knowledge utilization. From a comprehensive point of view, a good knowledge representation should have the following characteristics.

(1) The knowledge representation should be easy to modify and expand knowledge. Expert system in the construction and use of the process, the need to constantly expand and improve the knowledge base in the process of knowledge, knowledge representation is easy to modify and expand knowledge is directly related to the success of the expert system.

(2) The representation method should be simple and easy to understand. In order to make the knowledge base easy to modify and expand, should use concise and consistent knowledge representation, complex representation of the knowledge expressed by the method is difficult to understand. In this way, the established expert system can be made easy to operate and the procedure for processing knowledge is relatively simple.

(3) The representation method should be clear and unambiguous. Clear, unambiguous knowledge representation helps experts to understand and directly debug the knowledge in the expert system.

Currently used more knowledge representation methods are: predicate logic representation, generative representation, frame representation, semantic network representation, object-oriented representation, ontology-based knowledge representation.

2.3. Access to knowledge

A comprehensive analysis of the design steps of an expert system shows that the knowledge acquisition process is crucial in the design process of an expert system. It not only affects the system's ability to solve problems, but also has a great impact on the results and the way the system is organized. Knowledge acquisition is the most important and difficult task for knowledge engineers.

Knowledge is people's understanding of objective things and their laws, including the phenomena, essence, attributes, states, relationships, connections, and movements of things; knowledge is the methods, strategies, and experiences accumulated and summarized in the practice of transforming the objective world. In the expert system, domain knowledge is the generalization and summary of time experience of experts in the process of long-term domain research and dealing with various domain problems. It originates from and guides the practice of experts. In rule-based expert systems, knowledge base is also called generative repository.

Knowledge acquisition refers to the acquisition of domain knowledge from domain experts or potential knowledge sources (including experts, books, databases, and people's experiences, etc.), through the steps of identification, comprehension, filtering, and summarization, and storage, transmission, and transfer in some form in a computer. It includes problem definition, realization, refinement, and expression of facts and relationships acquired from experts. These expert techniques to be analyzed are collections of facts, processes, and rules of judgment that are highly specialized in a particular area of expertise, rather than general or common-sense knowledge. The transfer of such expert techniques is sometimes to be automated or partially automated by the program. The basic task of knowledge acquisition is to acquire knowledge for the expert system and to build a sound, complete and effective fact base to meet the needs of domain problem solving.

2.4. Reasoning

Reasoning styles are the functional structures on which the main operation of an expert system depends. There are two main types of reasoning in expert systems that use generative rules as their main basis, forward reasoning and backward reasoning.

2.4.1. Positive Rule Reasoning

Forward reasoning, also known as data-driven, is based on the principle of starting from existing, known data and knowledge and reasoning step-by-step through positive logic to get the final conclusion.

The general model of forward rule-based reasoning is the MIMO model, i.e., Multiple Input Multiple Output, which can be decomposed into multiple single-input multiple-output forms as in equation (1):

$$R(k): If\ x\ then\ y\ is\ \left(y_k, c_k\right)\left(k = \left(1 \cdots M\right): CF\left(y_k\right)\right) \tag{1}$$

where:

$R(k)$ denotes rule k, where $k \in U$. $X = \left(x_1, x_2, \ldots, x_m\right)$ is the normalized vector of user inputs. $Y = \left(y_1, y_2, \ldots, y_n\right)$ is the output vector representing the conclusions in the knowledge base, etc.

Conclusion of the rule $y \in V$ is the output of the forward reasoning of the system. y_k is the knowledge in the knowledge base and c_k is the certainty of y_k in the knowledge base.

M is the number of rules in the rule base. $CF\left(y_k\right)$ is the trustworthiness of the K rd knowledge, which represents the trust procedure of the domain experts on the mastery of the knowledge point, and the larger CF is, the stronger is the trust on the y_k analysis.

In the system, several different inputs may get the same y_k, if this happens, it means that the same knowledge point has been examined several times, at this time, the same y_k should be superimposed in order to increase the trust level, so it is necessary to modify the y_k corresponding to $CF\left(y_k\right)$, which indicates that the inference of this knowledge should be more trustworthy.

In this system, the forward inference process is shown in Figure 2:

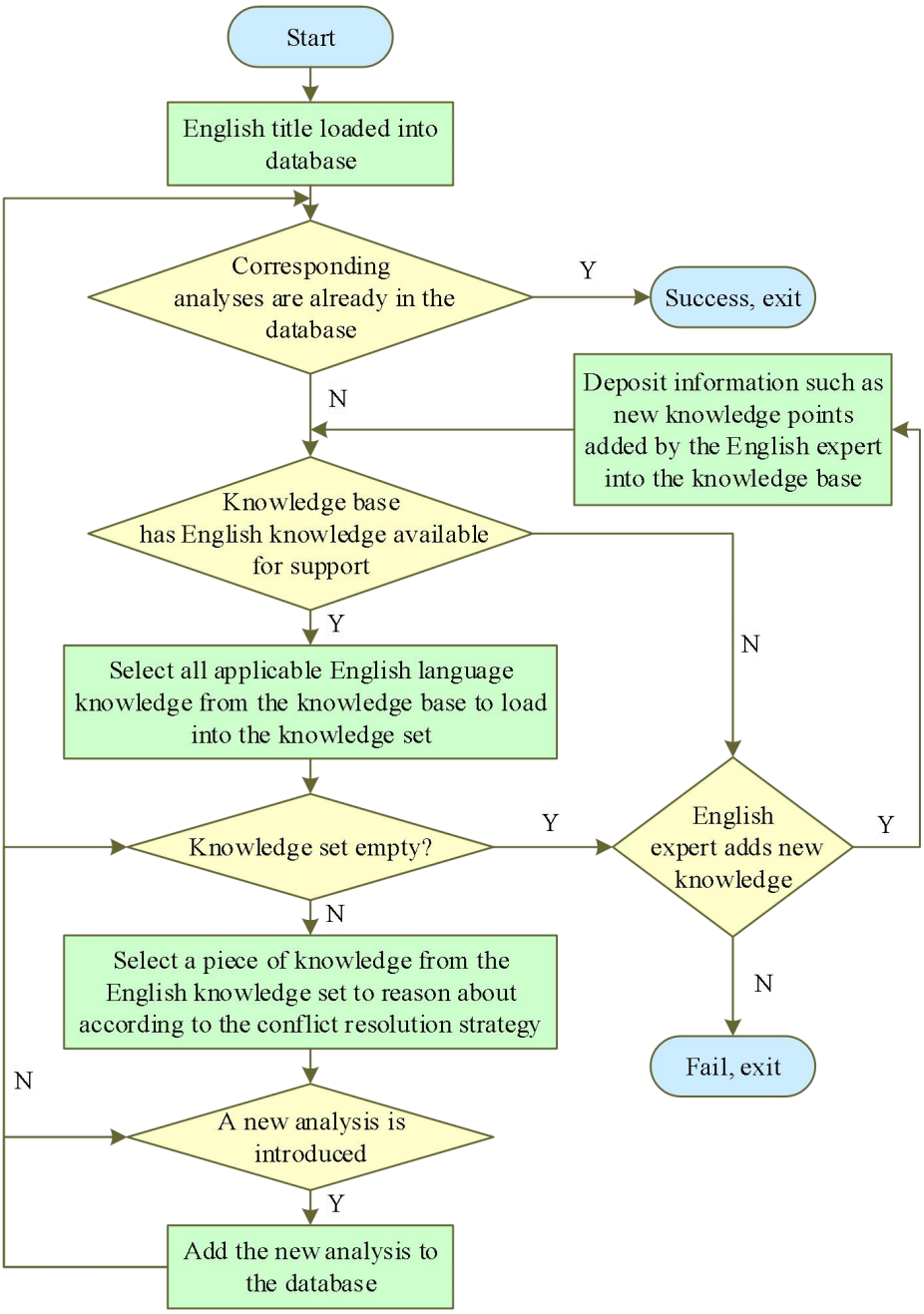


Figure 2. Forward reasoning of English expert system

2.4.2. Reverse Rule Reasoning

Reverse reasoning, also known as goal-driven, is the opposite of forward reasoning in that it takes a hypothesis as a precondition and then looks for all the factual bases that support the hypothesis to be valid and arrives at a conclusion as to whether the hypothesis is valid or not.

Here reverse reasoning is not the exact opposite process to forward reasoning, for this system there is an additional factor in reverse reasoning which is the uncertainty factor. This factor is cascaded through the uncertainty attribute, as the basis of the given, which itself has uncertainty, and the knowledge in the knowledge base, which ultimately yields results with uncertainty attributes by way of uncertainty reasoning.

Reverse Uncertainty Reasoning:

This system uses uncertainty rules to represent the knowledge, so the reasoning should also use the credibility-based uncertainty reasoning method to perform the operation.

Firstly, a fuzzy uncertainty rule relation equation is established as equation (2):

$$\mu_z = \{\mu_y \cdot W\} \tag{2}$$

Where: μ_z is the conclusion vector and is a logical operator.

Solve to get the inference pattern as in equation (3):

$$\mu_y \to \mu_{CF} \to \mu_z \tag{3}$$

where:

μ_y denotes the conclusion of forward reasoning y quantized vector $\left[\mu_{y_1}, \mu_{y_2}, \cdots, \mu_{y_n}\right]^T$.

W is the vector of weights $[w_1, w_2, \cdots, w_n]$. Let $\mu_P = \mu_y \cdot W$, assuming that μ_P is a weighted combinatorial formula, is a logical operator expression, then equation (4):

$$\mu_P = \sum_{t=1}^{n} w_i \cdot \mu_y \tag{4}$$

It is a weighted sum, which is out of the credibility of each item multiplied by the weight and then summed, so that the higher the credibility of each item, the greater the sum.

μ_{CF} is the plausibility of the final conclusion $(0 \le \mu_{CF} \le 1)$. This plausibility is obtained through a process of backward reasoning, based on the plausibility of the individual rules, which are added together to obtain the final result. The frequency of occurrence of the knowledge point represented by y_k as a proportion of the entire sample to be analyzed can represent its credibility in the analysis. It is well understood that the more often the test is given, the more accurate the analysis of the students' mastery will be.

Figure 3 explains the process of inverse uncertainty reasoning in this system:

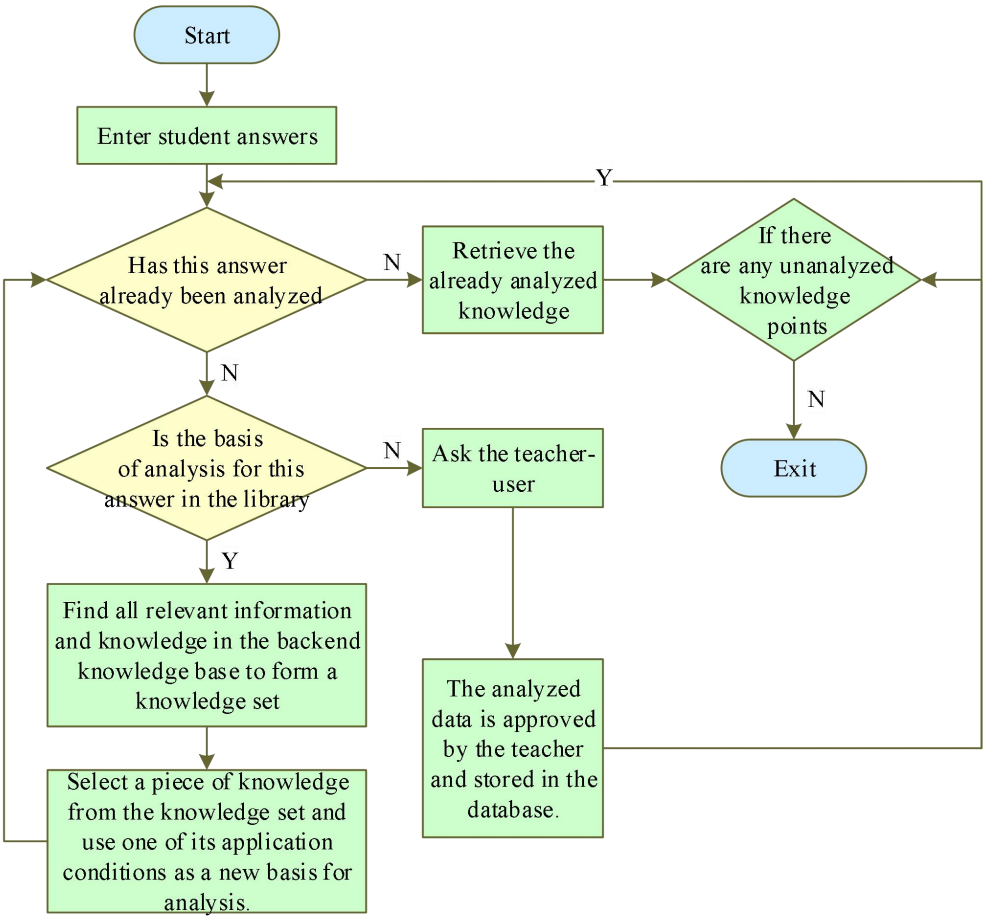


Figure 3. Backward reasoning of English expert system

Generally, in practical applications, the problems faced are complex, and approaching and inferring the problem from a single perspective can have significant drawbacks. Forward reasoning may produce dusty sub-results that the system does not need during operation, and the assumptions that reverse reasoning relies on will waste system resources and reduce operational efficiency if they do not match the actual situation. Therefore, combining forward and reverse reasoning, taking advantage of their respective strengths, is an excellent solution to this problem. This type of reasoning can be called is hybrid reasoning.

3. Experimental study design

3.1. Subjects of study

In this paper, 30 students from a college sophomore class, Class A, and 30 students from Class B are the objects of the study. Class A is an experimental class in which all 30 students participate in this paper's application experiment of the English teaching expert system, and Class B is a control class of 30 students. After comparing the English test scores within two years, the English scores of the two classes are roughly the same and belong to parallel classes at the same level. In this paper, the experimental class and the control class simultaneously take the same English paper written test, while the experimental class and the control class respectively use the English teaching mode based on this paper's expert system and the traditional mode to carry out teaching.

3.2. Research process

The experiment lasted for four months and was divided into three stages: before, during and after the experiment. For the experimental class, the English teaching mode based on the expert system of this paper was adopted, and the control class adopted the traditional teaching mode, and a specific experimental plan was formulated. At the end of the experiment, relevant data were collected and organized. The main content of the study is to investigate the effect of the English teaching mode based on the expert system of this paper in English teaching in colleges and universities, and the experimental plan and data support were provided.

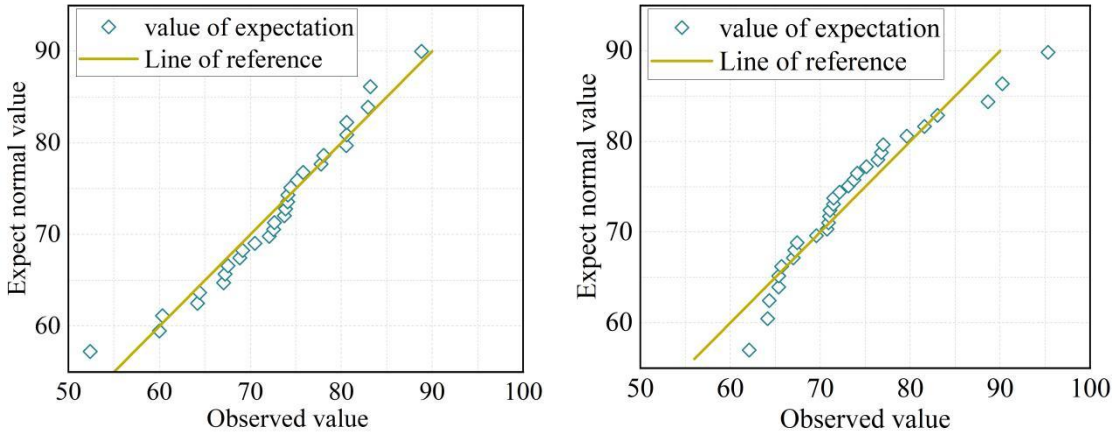
3.3. Pre-test scores

In this paper, we first conducted descriptive statistics on the basic English pre-test scores of the experimental and control classes, and the results are shown in Table 1.From Table 1, we can learn that: the total number of students in experimental class A is 30, and the average score is 70.57, with a standard deviation of 8.2, while the total number of students in control class B is 30, and the average score is 72.70, with a standard deviation of 7.7.As can be seen, the number of students in the experiments of both experimental and control classes A and B is similar. The total pre-test scores are also similar, while the scores are relatively concentrated overall.

Table 1. Descriptive statistics of English pre-test results

	Figure	**Maximum**	**Minimum**	**Mean value**		**Standard deviation**	**Variance**
	Statistics	Statistics	Statistics	Statistics	Standard error	Statistics	Statistics
Class A	30	56.00	91.00	70.5725	1.54987	8.20987	71.295
Class B	30	58.00	92.00	72.6983	1.30541	7.70023	60.028

Then the normality test was conducted on the total pre-test scores of experimental class A and control class B using Q-Q plots, and the results of the test are shown in Fig. 4. From Fig. 4, it can be seen that the scatters of both experimental and control classes are basically distributed around the diagonal line of the first quadrant, and it can be seen that almost all the scatters of experimental and control class A and control class B are distributed around a straight line, so that the English pre-test scores of experimental and control class A and control class B are both close to the normality of the distribution in this experiment.



(a)Class A (b)Class B

Figure 4. English pre-test results Q-Q chart

Next, an independent samples t-test was conducted on the total English pre-test scores of experimental class A and control class B. The results are shown in Table 2. Where F=0.076, P=0.782>0.05, thus the variance is chi-square, the value of significance (two-tailed) is 0.761 greater than 0.05 and the difference is not statistically significant. Therefore, it can be concluded that there is no significant difference between the experimental class A and the control class B in terms of their total scores on the basic English pre-test.

Table 2. Independent sample T test of English pre-test total scores

			English ability pre-test score	
			Homogeneity of variance is assumed	**Homogeneity of variance is not assumed**
Crack variance equality test	F		0.076	
	Significance		0.782	
T-test for equal mean values	t		-0.305	-0.305
	Degree of freedom		65	64.094
	Significance (double tail)		-0.761	0.762
	Mean deviation		-0.5017	-0.60161
	Standard error difference		1.96348	1.96612
	95% confidence interval for the difference	Lower bound	-4.52292	-4.5295
		Upper limit	3.31971	3.32604

3.4. Post-test scores

After the completion of the experimental content in experimental class A, a survey was conducted on the performance of nine indicators, namely, learning interest, learning efficiency, comprehensive effect, inspiring thinking, oral expression, mastery of key points, written expression, improvement of listening, and concentration of attention on English learning in experimental class A and control class B respectively, and the results of the survey are shown in Table 3.

Table 3. Post-test results of class A and class B

	Class A(Number of students)				Class B(Number of students)			
	Excellent (90)	**Good (80)**	**Fair (60)**	**Poor (40)**	**Excellent (90)**	**Good (80)**	**Fair (60)**	**Poor (40)**
Learning interest	18	5	4	3	3	21	1	5
Learning efficiency	20	4	3	3	7	16	4	3
General effect	22	4	2	2	5	19	6	0
Enlighten the mind	21	3	3	3	8	21	1	0
Oral expression	22	3	4	1	3	22	3	2
Grasp key points	19	3	6	2	4	22	2	2
Writing	21	6	3	0	5	18	3	4
Improve listening competence	25	4	0	1	6	20	3	1
Concentrate	26	4	0	0	3	25	2	0

As can be seen from Table 3, in terms of performance on the nine indicators, more than 15 persons in the experimental class A performed well, exceeding 50.00% of the total class size. And there are more than 15 people in the control class B all perform well, occupying 50.00% of the total class size. It shows that with the assistance of the expert system in this paper, the experimental class A has more obvious progress in overall English learning.

As can be seen from the previous section, there is no significant difference between the mean of the total pre-test scores of the experimental class A and the control class B (statistical calculation $P>0.05$). On the other hand, the mean values of the nine indicators in the pre-test and post-test of experimental class A, as well as the mean values of the nine indicators in the post-test of experimental class A and control class B, have some changes, and the results of the statistical calculation are shown in Tables 4 and 5.

Table 4. Class A Single average of pre - and post-test

	Before test		After test		Z-Value	Significance P-value
	Mean value	**Standard deviation**	**Mean value**	**Standard deviation**		
Learning interest	70.7	18.7	81.3	18.1	2.82	<0.01
Learning efficiency	72.3	18.5	79.2	17.3	2.27	<0.05
General effect	68.1	17.3	78.2	18.2	1.67	>0.05
Enlighten the mind	70.9	21.2	80.5	19.4	1.13	>0.05
Oral expression	71.2	20.4	79.7	15.7	4.51	<0.01
Grasp key points	69.5	15.2	78.9	18.7	1.51	>0.05
Writing	70.1	18.3	80.3	20.2	1.27	>0.05
Improve listening competence	71.3	16.6	80.2	10.2	7.31	<0.01
Concentrate	71.0	18.4	83.5	20.1	0.77	>0.05

Table 5. Individual mean values of Class A and Class B post-test

	Class A		Class B		Z-Value	Significance P-value
	Mean value	**Standard deviation**	**Mean value**	**Standard deviation**		
Learning interest	81.3	18.1	72.8	18.0	4.02	<0.01
Learning efficiency	79.2	17.3	72.9	18.1	2.41	<0.05
General effect	78.2	18.2	72.4	17.5	1.51	>0.05
Enlighten the mind	80.5	19.4	74.3	17.3	1.27	>0.05
Oral expression	79.7	15.7	74.6	20.0	4.55	<0.01
Grasp key points	78.9	18.7	71.8	16.1	0.83	>0.05
Writing	80.3	20.2	72.3	17.2	1.15	>0.05
Improve listening competence	80.2	10.2	74.1	17.6	8.61	<0.01
Concentrate	83.5	20.1	72.8	18.2	1.04	>0.05

As the data in Table 4 and Table 5 show, after the introduction of expert system-assisted teaching in the experimental class A, the average value of a number of indicators in the content of the test: interest in learning, learning efficiency, oral expression, and improving listening, the change is large and the

degree of improvement is very significant (P<0.01 or P<0.05), which indicates that multimedia computer-assisted teaching makes the content of the teaching present the expressive and infectious force of the art, the It is easy to stimulate students' interest in learning and improve students' learning efficiency, and its optimal combination and use of sound, images, animation, music, color, and vivid and realistic communication scenarios are conducive to the acquisition of knowledge and the cultivation of listening and speaking skills. The average value of the indicators: comprehensive effect, inspired thinking, written expression, and focused attention have different degrees of improvement, which is better than traditional teaching, but do not reach a significant difference (P>0.05). It can be seen that the English teaching expert system in this paper can achieve better results in the overall view, but not in all aspects, its effect has good, better, and poor aspects, the study of the effect of this paper's English teaching expert system to assist teaching is to recognize the specific role of this paper's English teaching expert system to assist teaching, in order to facilitate the effective application of this paper's English teaching expert system in the actual teaching and serve English education.

4. Conclusion

The purpose of this paper is to enrich the English teaching methods in colleges and universities, optimize the students' learning experience and improve their learning performance with the help of artificial intelligence systems. This paper takes the expert system as the basis and combines the reasoning method integrated into English teaching to obtain the English teaching expert system. In a university's English course teaching, more than 50.00% of the students in the experimental class A assisted by the English teaching system of this paper have excellent performance in various indicators of the English course, and many of the indicators have been improved to a very significant degree in comparison with the results of the control class B under the traditional teaching mode (P<0.01 or P<0.05). It verifies that the English teaching expert system in this paper has quite significant advantages in assisting college students in English course learning and improving their English performance.

The English teaching expert system designed in this paper takes data-driven as the main means to innovate the English teaching mode in colleges and universities and improve the quality of teaching, which is in line with the development of the times and has high application value in the development of English teaching in colleges and universities in the future.

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