Application and Design of Automatic Evaluation System in College English Writing Teaching

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Abstract: In the teaching of college English education in China, the lack of teachers and the mode of writing teaching can't keep up with the development of the times, which has seriously restricted the development of English level. Based on the above situation, the use of computer technology to improve the quality of English teaching and students' academic performances shows a strong feasibility. In this paper, firstly, the research background at home and abroad on college English teaching was introduced; on the basis of the constructing formative evaluation theory, the doctrine theory and the humanism theory, for the unique teaching mode of college English writing in China, the automatic evaluation system was applied to the construction and design of the multi-interactive teaching model of writing.

1. Introduction

The automatic evaluation system applied in teaching mode was born in the United States and other countries in the last century [1]. Among them, the representative automatic evaluation system mainly analyzes the level of an English article by analyzing the language used in the initial layer of the article [2]. In the middle of the last century, with the popularity of the Internet and artificial intelligence, especially the development of natural language processing and intelligent language teaching system, a breakthrough was made in the upgrading and improvement of the automatic writing evaluation system [3]. The initial country of writing automatic evaluation system is the United States, so the applications of automatic evaluation system are mostly implemented in the United States [4]. Through the study of its teaching model, we can establish a set of English writing system suitable for our country [5].

At the beginning of the design, the automatic evaluation system mainly carried on the multivariate data analysis to the testability of an article, such as the number of words and the length of the sentence. Subsequently, a scoring system was established for the English compositions judged by people [6]. With the improvement of the system, a new level of system was established according to the database data which is manually judged. The latter introduced the lexical and semantic evaluation in the system, and more factors were incorporated into the system design [7]. Through the understanding and resolution of foreign systems, an evaluation system that can detect latent semantic analysis based on the author and the deep meaning expressed can be established [8]. The scoring mechanism of this system is more accurate, and for the specific vocabulary evaluation, it can dig out the deep meaning of the article and make the abstract evaluation [9].

2. State of the Art

In foreign countries, the application of computer automatic evaluation system is gradually popularized. Automatic evaluation on the Internet can greatly reduce the negative impact of the shortage of teachers [10]. In this case, in the process of studying the automatic evaluation system abroad, computer technologies and scheme methods used in it were integrated and applied to the teaching of college English writing [11]. Some linguistic errors in the evaluation process, including grammatical errors, were dealt with in a targeted way. At the same time, the automatic evaluation system with automatic feedback function was designed, which can effectively improve the comprehensive writing level of English learners, and has a positive impact on the field of college

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English teaching [12].

In China, the research and development of automatic evaluation system are still in the infancy, and many aspects of computer technology are still immature [13]. At present, among evaluation systems independently designed and developed in China, most of the application software is still in the experimental stage, and they have a long way to go to be officially applied to the English writing scores and the actual teaching [14]. At home and abroad, the use of automatic scoring system of English composition technology can be divided into two major areas: the first is the scale of the English test, and it has the advantage of wide range, but the disadvantage is that the accuracy is poor; the second is the English auxiliary writing. Applications of automatic scoring technology can also be divided into two aspects: the first is whether the human scores can achieve synchronization, which is the assessment of the intelligence of the system; the second is the research and development of automatic scoring system in the aspect of classroom aided effects, as whether this system can significantly improve students' writing reviews and the classroom quality [15].

3. Methodology

3.1. Design Factors

Computer English scoring can make English teachers get rid of boring composition correcting works, and it can eliminate the mistakes caused by subjective factors. In addition, the computer has the advantages of fast reading. In this paper, through the analysis of confirmatory factors, the standard validity was tested to the maximum extent to verify the effectiveness of computer scoring system. In the process of application of design research, considering that system will produce different evaluation results for different English compositions and the system may have defects to be improved to some extent and cause some unnecessary effects, it is necessary to form a connection in aspects of information collection, information processing and information output. The design of the system needs the strong logicality, and innovation and the real-time information processing ability are also essential. Constantly revise process can achieve the original intention of making public profits. In order to complete the blueprint of the automatic evaluation system, the preliminary design pattern mainly adopts the pattern, as shown in Figure 1.

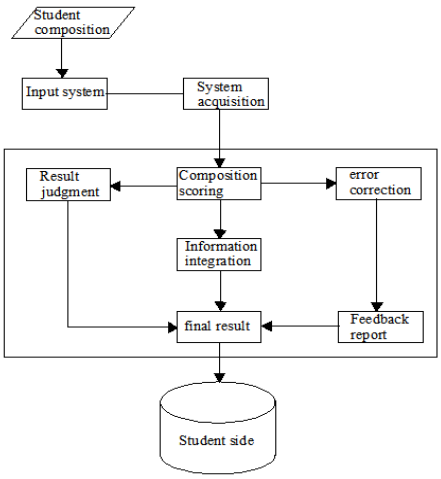

Figure 1 Operation of automatic evaluation system

The Internet is the way of information transmission and retrieval. Computer technologies can carry out huge amount of information and data acquisition, analysis, and can be put into the education model. Based on the above parts, the text patterns of the students' English compositions were collected and inputted into the system. Students' information was saved individually and stored in the computer database, which is helpful for further works. Automatic evaluation systems need to be updated continuously. At this stage, students' vocabulary accumulation will increase with learning, and their abilities will also be improved. The design of the system must be synchronized

with the students' learning ability. Subsequently, the compositions submitted by the students were processed. According to their vocabularies, their compositions were graded. Then, according to the scores of other aspects and different English compositions, different teaching modes and contents were formulated by the feedback mechanism. According to the correction of students' compositions and feedback of the automatic evaluation system, the contrast of data was carried out, and the specific data is shown in Table 1. These data contribute to the further improvement of system designs.

Table 1 Automatic evaluation and manual correction of comparative data

Contrast data	Accuracy rate	Objectivity	Feedback ability	Promoting effect
Manual correction	0.91	0.85	0.96	0.85
Automatic correction	0.98	0.99	0.95	0.94
Semi manual and semi-automatic	0.98	0.97	0.99	0.92

Based on the above factors, the targeted teaching model was integrated with the problems of students. For example, a student's vocabulary level is poor, but he has a high level of meaning. Therefore, the database can automatically retrieve this situation and use this system to connect foreign advanced processing schemes and the course content of this student. Therefore, it can effectively guide this student and solve his problems. The solution plan can be applied to this student's English courses, and the computer can do English teaching works for him. This model can improve the efficiency of education and reduce the burden on teachers. The database of this system can store a large number of teaching information and contents, so as to cope with the problems encountered by students in English learning. The use of this model can change loopholes and the extremely low efficiency of traditional teaching, and students can get real time and objective feedback of English composition evaluations in courses. They are psychologically receptive to the system because it can increase students' interests and motivations in learning English.

3.2. Application Design and Risk Algorithm of Automatic Evaluation System

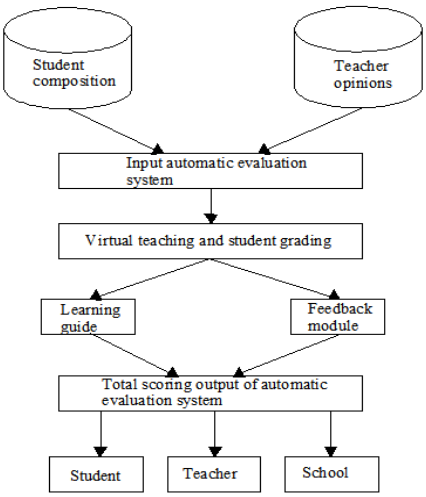

Figure 2 Design flow of automatic evaluation system

After determination of the design factors of the automatic evaluation system, the system construction is carried out. In the process of research, the construction of the system includes three major directions. The first stage is the information acquisition phase. The original intention of the automatic evaluation system is to serve the college English learners, so the targeted design and input of the data should be paid attention to. The second stage is information processing phase. After the students' compositions are inputted into the system, the system can score, process and

analyze them. For different students, it can feedback a series of information processing results based on students, for references and analysis for the students and all users of the system. The third stage is the integration stage of information. Based on the essays submitted by the students, the automatic evaluation system can analyze vocabularies, frameworks and meaning analysis, and integrate achievement evaluations, which is also the most important stage. The last stage is the output stage of information. The results and errors of the students' English compositions can be returned to the students through the terminal of the automatic evaluation system for the reference and use of the students. These four stages are the operational principles of the automatic evaluation of the teaching system. These four stages can link each unit of the system, thus reflecting the characteristics of the efficient processing of the automatic evaluation system.

Considering the students' trust degree in the results of the automatic evaluation system, under the relevance of the evaluation system, in the information integration stage, a set of accurate and objective model that ensures the ratings was introduced. In order to ensure the accuracy of the results, it is necessary to use algorithms to reduce the system failure rate. In the design of this link, first of all, through the two parameters as X and Y, a corresponding probability calculation was constructed and assumed to be F (X, Y). After the input of the corresponding training system, an optimized result, Y, was obtained. The formulas used are shown below:

$$(X_i, Y_i), i = 1,2....,n, X_i \in R^m, Y_i \in Y \tag{1}$$

This formula can not only minimize the risk of fault, but also reduce the error to the minimum.

$$R(\omega) = \int L\left(Y, F\left(X, \omega\right)\right) dF\left(X, \mathrm{Y}\right) \tag{2}$$

By this formula, the corresponding prediction function was obtained. Among them, F (X, w) stands for the set of prediction numbers. With these data, the corresponding function relation was established and the corresponding difference sequence was obtained. If the corresponding classification problem is encountered, the method of set function can be adopted. Suppose that Y is between the regions (-1, 1), then the loss function is as follows:

$$L\left(Y, F\left(X, \omega\right)\right) = \begin{cases} +1, Y = F\left(X, \omega\right) \\ -1, Y \neq F\left(X, \omega\right) \end{cases} \tag{3}$$

After the prediction of the risk value and the corresponding loss function, the output probability between the assumed system S and the learning system ST was calculated according to a series of risk values, and the corresponding joint probability was calculated. The formula (3.2) shows that the joint probability calculation can be used to minimize the expected risk. The joint probability is unknown, so the minimum value of R can't be directly obtained. However, with the large number theorem, according to the known training sample set, the arithmetic mean can be used to ensure the accuracy of the scoring results:

$$R_{emp}(\omega) = \frac{1}{n} \sum_{i=1}^{n} L\left(Y_i, f\left(X_i \omega\right)\right) \tag{4}$$

4. Result Analysis and Discussion

In the design process, in the computer processing stage, the computer technology was used to analyze the level of each fraction. According to the score inconsistency of two raters, it was repaired. Computer automated evaluation system can solve the validity problem in large-scale hierarchical testing. The system is based on the additional announcement consultation module function, curriculum setting module, student management module, registration module and the teacher management module, so it can serve the students and popularize the teaching management information for them, so they can communicate and cooperate with each other. On the other hand, it uses HIA model to manage students' learning situation and basic situation, the teaching quality of teachers and the reasonable situation of curriculum setting.

In the scoring process of the system, in the process of automatic scoring of human-computer interaction, according to the availability of these data, they can be divided into data that can be directly used and indirectly used. A small amount of data was directly applied to the target view, while the other part of the data was weighted based on the algorithm. The obtained data solved the decomposition of the above characteristics, and the optimal solution of the total mapping matrix was finally obtained. Therefore, the system can output relatively objective and accurate scoring results. In the process of calculation, parts of the parameters are shown in Figure 3.

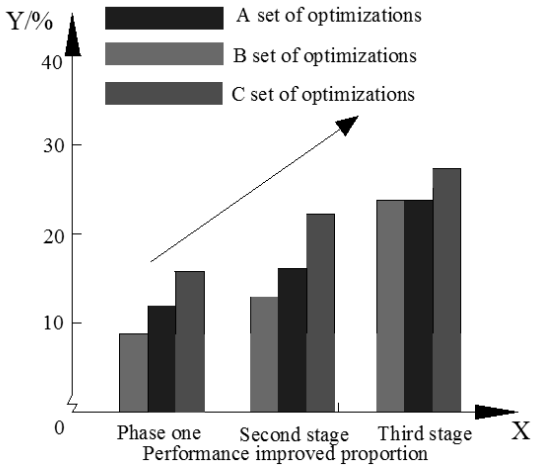

Figure 3 Parameter chart of score access data

In the test of information processing integration, the three-tier architecture model was adopted. The bottom layer is used to collect the database; the middle layer is used to organize the operation; the upper layer is the presentation layer, with the purpose to provide the students' exchange learning platforms and finish the input and output of the data more smoothly. In the aspect of installing software architecture, three levels are defined as the data acquisition layer, logical service layer and presentation layer. The presentation level is the student interface, which supports the keyboard and mouse input, and it can upload the input data to the logical business layer. The logical business layer can process the data according to the data provided by the presentation layer, and feedback the result of the processing to the presentation layer. If the data needs to be saved, it will submit the data to the data collection layer. The data collection layer can be directly linked to the relational database, and according to the instructions of the logical business layer, it can delete, add, find data, and return the results to the logical business layer. In order to verify the coherence of the overall linkage, the methods shown in Table 2 were used.

Table 2 Data link performance of three tier architecture model

Performance testing	Operability	Data processing	Data transmission	Performance
Data acquisition	73.2%	89.6%	65.7%	98.2%
Logical service layer	69.1%	92.6%	67.2%	97.6%
Presentation layer	70.5%	78.4%	71.6%	99.6%

Finally, the conflicts between each module were tested. The three-tier architecture model can decompose the system development into many goals, and apply each goal to solve each small task. Staffs only need to pay attention to the current application layer structure, and upload the data into inter layer data exchange mode. The function module is easy to be updated, and the virtual teaching module mainly completes the classroom teaching work with the help of teachers.

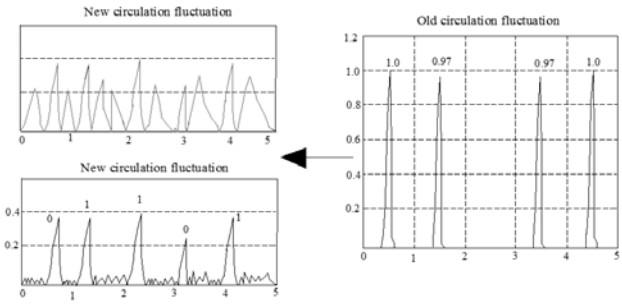

Figure 4 Change of conflict rate of each module

The four modules mainly complete four independent functions. Their contents complement each other, so they can work together to complete the learning process. The virtual teaching and learning resources module has a fast and convenient query resource library with a large number of data types, which is very critical for virtual teaching. With the increasing popularity of the program structure, many operations and software data have been concentrated on the server, so users only need to use the browser at the client's port, which solves the problem of program deployment. For programmers, the data is expressed on the server, so it is easy for them to focus on processing. However, if there are large-scale applications, the program requires the server to show a higher data throughput capability. It runs codes in a compiled way, so it has completely replaced the traditional server processing technology in the interpretation of the implementation of the way. It supports class definition, inheritance and derivation, and it has almost overcome all the shortcomings of the traditional method, so it has become a powerful link in the development of structure applications. The driver model of simulation events using client processing techniques makes running, building, and publishing network applications as easy and powerful as developing legacy applications. The software defines various controls and supports the data bound, so little code can complete the display of the data, which greatly improves the development efficiency.

5. Conclusions

China's attention to college students' English level has been gradually improved. Strengthening the quality of college English teaching management is bound to be coordinated through all aspects. Computer technology is a potential resource to be developed, so how to correctly use the computer and to grasp its positive factors will greatly affect the traditional teaching mode, and an efficient operating environment can be obtained. The development goal of the system was decomposed into many small targets, and the system applied each goal to solve each small task. Staffs only need to pay attention to the current application layer structure, and upload the data into inter layer data exchange mode. The function module is easy to be updated. Four modules complete four independent functions, and their contents can complement each other, thus ultimately helping students to complete the English learning process together. At the same time, in response to the deep connotation of accurate vocabularies reflected in the evaluation composition and for how to design the correct correction link according to the basic situation of students, more scholars still need to carry out more in-depth researches from two levels of practice and theory.

Acknowledgements

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References

[1] Dong, Z.Z., Zhang, N., Shen, Z.P. Marine auxiliary boiler automatic evaluation system based on Web. Dalian Haishi Daxue Xuebao/journal of Dalian Maritime University, vol. 43, no. 3, pp. 95-

100, 2017.

[2] Gergelitsová, Š., Holan, T., GeoTest—A system for the automatic evaluation of geometry‐based problems. Computer Applications in Engineering Education, vol. 24, no. 2, pp. 297-304, 2016.

[3] Campatelli, G., Scippa, A. Development of an artificial vision system for the automatic evaluation of the cutting angles of worn tools. Advances in Mechanical Engineering, vol. 8, no. 3, 2016.

[4] Muñoz, O.M., Quimbaya, A.P., González R A. A System for the Semi-Automatic Evaluation of Clinical Practice Guideline Indicators. International Journal of Reliable and Quality E-Healthcare, no. 4, pp. 1-10, 2016.