

Deep Integration of English Information Teaching Based on Differential Evolution Algorithm

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Abstract

Modern information technology is becoming more and more mature and the use of multimedia such as computers is becoming more and more popular. English teaching in our country's undergraduate colleges is also developing in line with the times, and information-based teaching represented by information technology means such as computers and multimedia has gradually emerged. The purpose of this paper is to analyze the impact based on differential evolution algorithms and to develop an effective approach to English language learning, with a focus on improving the quality of education for undergraduate students. By collecting, sorting and reading related journals and publications, using the method of query research, based on the variance evolution algorithm, the differential learning research based on the English algorithm is carried out for the students of the two optional classes in high school. The survey results show that 63.2% of the respondents believe that learning English based on different evolutionary algorithms may stimulate their interest in writing. In addition, the comparison of the results of classroom experiments and classroom control shows that 95% of the respondents believe that the differential evolution algorithm is applied to English computer science, and English learning with some technologies will be improved.

Keywords

Differential Evolution Algorithm, English Teaching, Information-based Teaching, Deep Integration.

1. Introduction

In recent years, the rapid development of science and technology has promoted the wide application in teaching. The information-based teaching method also causes teachers to be more casual in the practical application, so it is easy to cause problems such as difficulty in the selection of teaching materials and distraction of students' attention [1]. In English, information-based educational applications are common [2].

English information teaching based on differential evolution algorithm has been studied by many experts. DorAE describes a multi-objective differential evolution (MODE) algorithm for measuring analog circuits using load distance. MODE is used to calculate the Pareto side of two object optimization problems, namely increasing the cutting frequency and reducing the investment of the current second-generation manufacturers. To demonstrate the capabilities of MODE, it is compared with a non-sequential genetic algorithm (NSGA-II). These comparisons show that MODE outperforms NSGA-II in terms of optimal solution quality, variability of these solutions before Pareto, and computation time [3]. MutluMM treats transmission risk as a travel factor and risk reduction as a channel frequency correction issue. A two-stage optimization model was developed to reduce the overall risk of terminal infection and increase the overall risk of infection. Differential evolution algorithms are used to solve NP-hard-layered traffic

network design problems. The new airport service is proposed for a higher-level model that considers pollution risks in terms of vehicle flow at public transport stops. Traffic movement is determined using a traffic distribution model that balances user constraints. This model is suitable for small legend network and medium test network [4]. Cardenas] proposes a new method strategy based on the use of emerging technologies for meaningful learning as a primary instruction for visually impaired students. Therefore, a good practice roadmap using this approach will allow the establishment of a clear process to achieve active, meaningful and autonomous participation of students using a minimum of time [5]. The advancement based on information technology means such as computers and multimedia networks not only promotes the modernization and information-based process of education, but also greatly improves the level.

Aiming at the practical problem that colleges and universities urgently need to cultivate applied talents who adapt to the development of the information age, this paper starts from the characteristics of undergraduate college students, collects, organizes and reads relevant literature materials, combines relevant theoretical knowledge, and conducts a survey method. , Analyze the effect of English information teaching based on differential evolution algorithm, and form an effective English classroom teaching method that is conducive to improving the teaching quality. In the context of the transformation of colleges and universities, my country attaches great importance to the development of undergraduate colleges, especially in the improvement of their comprehensive foreign language application ability, which has a wide range of theoretical and practical significance.

2. English Information Teaching Based on Differential Evolution Algorithm

2.1. Differential Evolution Algorithm

The differential evolution (DE) algorithm is an emerging evolutionary computing technology. The algorithm was originally used to solve the Chebyshev polynomial fitting problem. Since this problem is a real number optimization problem, the real number coding is used to directly represent the individual. The vector difference is used to perturb the vector population, so the core operation of the algorithm is the mutation operation. Then the differential evolution algorithm gradually became an effective algorithm for solving complex optimization problems. The search process of differential evolution algorithm is generated by mutual cooperation and competition among individuals in the group, and it is an algorithm based on group intelligence optimization [6-7]. The coding method used is real number coding, which performs global search and reduces the complexity of the operation. Differential evolution algorithm has strong global cohesion potential and optimal ability. Also, differential evolution algorithms are very general and suitable for solving complex growth problems. As an efficient parallel random search algorithm, differential evolution algorithm has become a hot research topic in computational intelligence and related neighborhoods. At present, differential evolution algorithms have been widely used in a series of fields such as neural networks, power systems, and control engineering [8-9].

2.2. English Information Teaching

English teaching emphasizes the process of learning English based on information. It refers to the combination and the application in the process of English learning, so that English teaching keeps pace with the times [10].

Information-based learning is a modern teaching applied to teaching, which is based on information technology. The importance of computer science education is that, first of all, through the development of computer science education, it is possible to innovate traditional

English teaching methods, change traditional English classroom teaching methods, and integrate into the study of program concepts. Technology education relies on computer technology to assist English teaching in teaching. Introduce clear visual information into English classrooms, create a flexible learning environment, meet students' needs, expand students' English language ability, and stimulate students' interest in learning English from a new perspective. The second is to use information-based teaching methods to create a realistic learning environment, improve students' preferences and characteristics, improve video materials that meet academic requirements, and promote students' learning in the classroom. Video materials are a great way to show what people in English-speaking countries really think. Improve the learning environment and improve teaching outcomes [11-12]. For example, record students' interests and characteristics, activate videos that meet teaching requirements, and facilitate students to learn in class. Video apps can show the real world. Improve the learning environment and improve teaching outcomes.

2.3. Influence of Information Teaching Based on Differential Evolution Algorithm on English Classroom

(1) The role of teachers

Influenced by the traditional Chinese educational model and the historical influence of the Soviet educational model, the role of teachers still remains in the role of "teaching". The role of teachers has begun to change in the information-based teaching [13-14].

(2) Information literacy

Teachers must learn to update their own knowledge system and update their information-based capabilities. The development of modern information technology is advancing by leaps and bounds, and changes are basically taking place every day, which puts forward higher requirements for college English teachers. They no longer teach with chalk, blackboard and books, but need to use high-tech for teaching. Teaching can occur in the classroom, as well as on computers, mobile phones, and related platforms. Therefore, teachers' information literacy is the key to solving problems related to information-based teaching [15].

(3) Teacher-student relationship

Teacher-student relationship plays a very important role in teaching. It is not only the basic condition for the successful completion of teaching activities, but also the vivid embodiment of teachers and students' emotion, value and meaning in teaching and teaching activities. For a long time, in addition to imparting knowledge, teachers also need to have emotional input in teaching. These emotional factors will enable students to acquire emotional cognition and emotional experience, so that students' feelings about teachers can be transferred to classrooms and courses. The teacher-student relationship will continue from the classroom to the extracurricular, and even a lifetime. The so-called "teacher for one day, father for life", a good teacher-student relationship has a lasting positive impact on both students and teachers.

3. Investigation and Research on English Information Teaching Based on Differential Evolution Algorithm

3.1. Investigation Method

By collecting, arranging and reading relevant journal literature, the questionnaire topics designed and designed for this topic were repeatedly deleted and revised, and finally the questionnaire was perfected. There are 25 questions in this questionnaire, including 23 objective questions and 2 subjective questions. The questionnaire mainly investigates the situation of English information teaching based on differential evolution algorithm on the students of two selected classes of undergraduate colleges from the perspective of learning situation, learning interest and academic performance.

3.2. Data Collection and Organization

In the course of the experiment, based on the differential evolution algorithm to guide the design of information-based English teaching classrooms, teaching experiments will be carried out in the experimental class, and after a period of experimentation, the pre-experimental results and post-experimental results of the two classes will be analyzed. Analyze and compare. In this process, the method of questionnaire was used to investigate students' interest in English learning and collect data to facilitate data analysis and comparison before and after the experiment. In the whole process, the author mainly used WPS and Word software to sort out the experimental data, and chose to use SPSS software to analyze the data. The t-test formula used in this paper is as follows:

$$t = \frac{\bar{X} - \mu}{\frac{\sigma X}{\sqrt{n}}} \quad (1)$$

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2} \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}} \quad (2)$$

Among them, formula (2) is the double population test, the s_1^2, s_2^2 is the two-sample variance, and the n_1, n_2 is the sample size.

4. Analysis and Research of English Information Teaching Based on Differential Evolution Algorithm

4.1. The Influence of English Information Teaching on Learning Interest

The paper compares the difference between information-based teaching method and the traditional classroom teaching method, asks students which teaching method they prefer, and which teaching method they think can improve their interest in English learning.

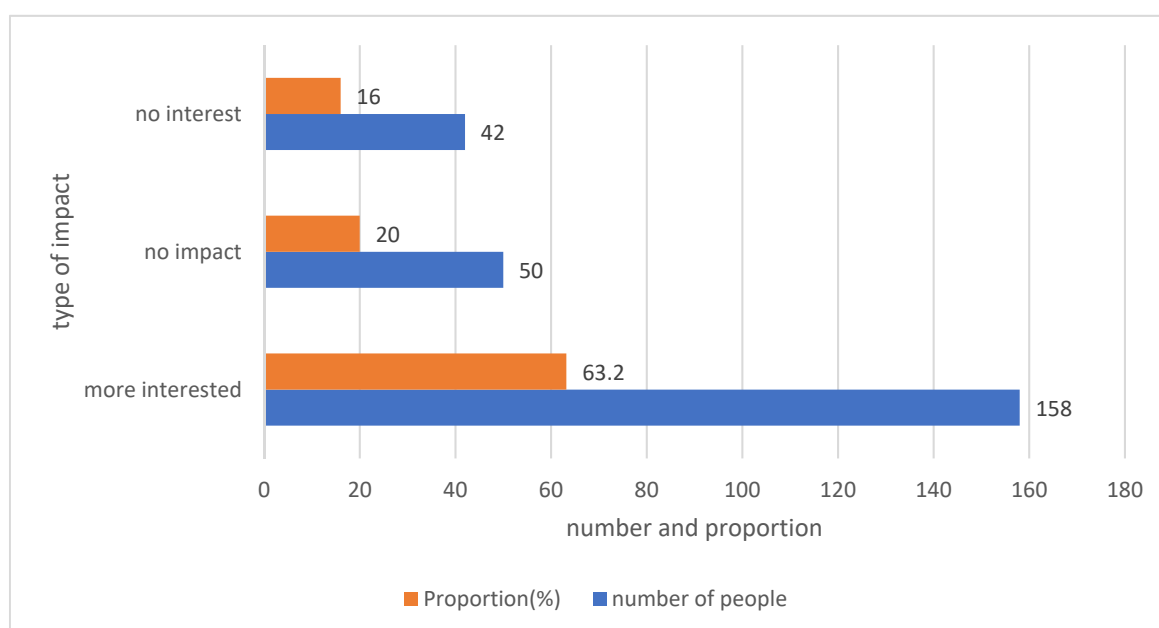


Figure 1. The Influence of information Teaching on English Reading Interest

It can be seen from the results in Figure 1 that 158 students believe that the information-based teaching method based on the differential evolution algorithm can more stimulate their interest in reading, accounting for 63.2% of the total number; 50 students think that the degree of influence of the two on reading interest is similar ; The remaining 42 students thought that the traditional teaching method could stimulate the interest in reading, while the information-based teaching method could not enhance the interest in learning. It can be seen that the information-based teaching method based on the differential evolution algorithm still has an application basis in English reading teaching.

4.2. Comparison of Pre-test and Post-test Scores

After the teaching experiment, an English test was carried out in both the experimental class and the test scores of the two classes were recorded. 100 points, the data analysis is shown in Table 1:

Table 1. Comparison of pre-test and post-test scores

	Pre-test	posttest	t	P
Experimental class	60.21	73.25	8.953	0.000
control class	67.52	70.12	2.356	0.015

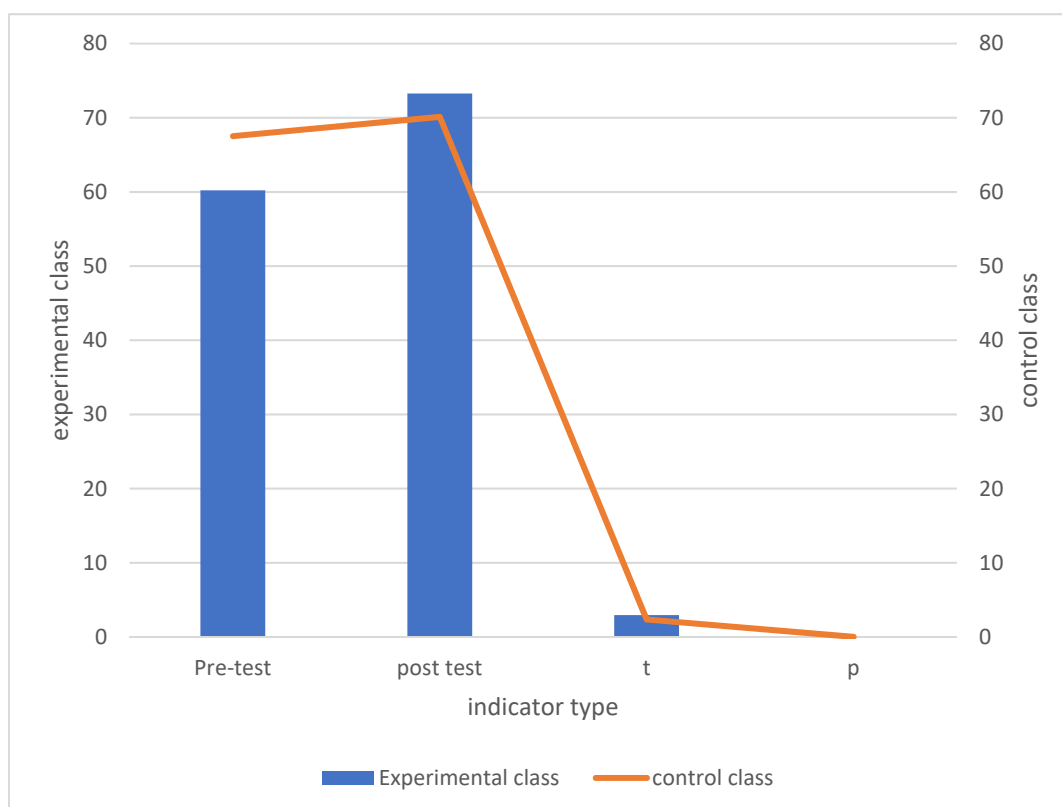


Figure 1. Comparison between experimental group and control group

As shown in Figure 2, the function uses SPSS software to analyze the scores of the two classes. First, through the independent t-test model, it can be seen that there is a statistical difference between the test level after the experimental class and the pre-test level ($P < 0.05$), and the post-test score is significantly higher than the pre-test score. Therefore, it can be concluded that the application of English informatization teaching based on variance evolution algorithm can significantly improve students' reading ability, and conversion is essential. And from the perspective of standard deviation, the post-test of the experimental class is significantly lower

than the pre-test, indicating that the evaluation algorithm of the experimental class using English information based on variance evolution is more complicated than before. The scores of the control group after the test were significantly different from those before the test ($P < 0.05$). But judging from his grade point average, his progress was not as good as the experimental class. After the test, the score of the control class was slightly lower than that of the experimental class, but the difference was not statistically significant ($P > 0.05$). From the data, we can clearly see that the score of the control class after the test is lower than that of the experimental class and slightly higher than that of the pre-test class. It can be seen that the algorithm of differential evolution is suitable for the learning of English information, which can improve the interest of English learning.

5. Conclusions

Before the test, this paper selects two classes with similar English scores and the control class to conduct teaching experiments. In the test class, the English level of both classes was higher than that of the control class. After the teaching experiment, the experimental class has made some progress, but the experimental class's performance has improved more, its progress is more obvious, and finally surpassed the control class. We can know from this that the application teaching method based on the differential evolution algorithm and the existing information-based English reading teaching method in English reading can promote the students' English reading. The way under the guidance promotes the effect is more obvious. In addition, the information-based teaching method based on the differential evolution algorithm is also convenient for teaching, which is very advantageous. After applying this model, the instructional design becomes more organized and the logic is clearer.

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