Application of Artificial Intelligence to Higher Vocational English Teaching in the Information Environment

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Abstract. In the information environment, artificial intelligence (AI) has begun to penetrate into college English teaching, where a vast corpus is provided for learners to practice college English skills through the AI platform. AI has offered more learning resources and changed the learning styles of learners. It can analyze the personal characteristics of learners, design suitable learning approaches, select the reasonable corpus, and match the corresponding learning resources, thereby making college English learning more efficient and personalized.

Keywords: Information Environment, Artificial Intelligence, Higher Vocational English

1. Introduction
Nowadays, we have entered the information era, when information technology (IT) is gradually integrated into all walks of life, affecting people's lives, learning, and work. With the advancement of IT, artificial intelligence (AI) has begun to penetrate various fields and gained considerable attention from all sectors of society [1-2]. The influence of AI in the field of education is also growing, which has a significant impact on English teaching, changing the traditional teaching mode and learning mode of college English. The global revolution of information and IT is changing the face and pattern of today's world in an unprecedented way, determining the direction and content of social change[3]. Several development trends of the information age have become irreversible trends. The full application of network information and Internet technology in politics, culture, education, and other fields. Globalization have become a reality and an inevitable trend. In the field of education, cloud computing, big data, the Internet of Things (IoT), AI and other new carriers and technologies are comprehensively and profoundly affecting the way and form of education. To speed up the modernization of education and improve the overall quality of the people is the fundamental task to achieve education power [4]. The IT of education has become an essential symbol of the modernization of education. Therefore, it is vital to speed up the construction of IT to promote the modernization of education. In the field of basic education, it is a hot topic and a critical content to improve teachers' IT literacy and carry out the deep integration of IT and learning and teaching[5-6].

2. AI in the information technology environment
“AI”, the full name of AI, was originally proposed at a seminar held at Dartmouth University in the United States in 1956. AI is a new technology science, which is used to research, simulate, develop,
and extend human intelligence.

Problems in English teaching are solved based on AI. The adaptability of the design of the English teaching mode directly affects whether the algorithm can resolve the resource conflicts in English teaching problems and find the optimal solution of combinatorial planning. As a multi combinatorial goal planning problem, English teaching problems are affected by multiple constraints. The comprehensive evaluation of these constraints is taken as the fitness function of this algorithm, which is expressed as follows

$$f_t = \frac{1}{1 + crash_g} + reward_s + \sum_{j=1}^{\text{ntime}} \sum_{i=1}^{\text{ngroup}_j} u_{ji} + \sum_{j=1}^{\text{ntime}} v_{ji} + w_j + r_i$$

(1)

Where \( crash_g \) stands for the number of conflicts for the individual student; \( reward_s \) Reward index for the individual student; \( u_{ji} \) Assign uniformity to the teaching time period of the first course in the teaching group; \( n\text{team} \) is the number of groups; \( n\text{course}_s \) It is the total number of courses in the teaching group after stratification. It is used to count the teaching time distribution records of the course in its group. \( n\text{time} \) is the total number of teaching time periods allocated to the course. The uniformity of the distribution of the course in the teaching time period is:

$$u_{ji} = \frac{\sum_{j=1}^{\text{ntime}} d_{ij}^\alpha}{\text{ntime}(\text{ntime} - 1)/2}$$

(2)

Where \( d_{ij}^\alpha \) represents the \( \alpha \) Teaching period to \( \beta \) distance between teaching periods.

### 3. Effect of AI on higher vocational english education

In the context of education reform in the new era, English, as a universal language in the world, is paid more attention to the practicability of College Students' English. The key point of English teaching reform in higher vocational education is to cultivate students' comprehensive practical ability of English. Students should not only master grammar and vocabulary, but also have English core literacy, that is, language ability, cultural awareness, learning ability and thinking quality. Hence, in the period of the rapid development of IT, the use of AI in teaching enables learners to break through the limitations of time and space and carry out adaptive learning. The emergence of machine translation, natural language understanding, speech recognition, and other language service products in the field of AI has brought a lot to college English teaching.

The emergence of AI products is changing the learning style of learners. In the traditional education, students can only learn by indoctrination in the classroom, the teaching time is limited, the teaching resources shared by teachers are not enough, and the amount of information received by students is not much. With the application of AI, students can obtain learning resources through multiple channels. According to their own characteristics, AI can automatically evaluate the situation of students, select reasonable knowledge for them, students can learn independently, and AI can give feedback on learning results in time. This not only strengthens the students' independent learning ability, but also helps their personalized learning. The emergence of AI is changing the essential functions of teachers. In traditional teaching, teachers can only communicate with students in class and choose teaching content according to experience. In the era of AI, teachers can check the learning


effect of students through the Internet after class, communicate with students online, answer questions in time, and improve the quality of teaching. AI products can automatically evaluate students' learning situation, reduce the burden of teachers' correcting homework, teachers can have more time to understand each student's learning situation, make teaching adjustment, teach students according to their aptitude, one-on-one guidance, effectively improve the quality of teaching. AI can also effectively solve the shortage of teachers in the current English teaching reform in higher vocational colleges. In particular, in slightly backward areas, teachers are lack of resources, which can be made up for with the support of AI products.

4. Application of AI to higher vocational english teaching

In the field of Higher Vocational English, with the development of AI, AI products are more and more closely combined with English learning. In 2003, GUI Sichun and Yang Huizhong developed the corpus of Chinese English learners; Yang Yonglin developed the corpus teaching model training system based on AI; AI + big data gave birth to the English composition automatic correction system, which uses the English corpus of the Internet to correct the vocabulary, collocation, grammar and syntax of students; in the field of translation, the AI translation based on cloud services, In terms of College English listening, students can use AI to choose suitable listening materials from a large corpus according to their characteristics and English level. In the aspect of spoken language training, the AI robot is perfect for students to use. It can always talk with students everywhere, which solves the problem of students' difficulty in speaking and inaccurate voice. As college English teachers, we must think about the impact of AI on our work, analyze the advantages and disadvantages, make good use of AI, and serve for College English teaching.

129 non-English majors from two classes of grade 2010 were selected as the research objects according to the results of Public English entrance teaching in higher vocational colleges. One is 66 students in pharmaceutical class, which is an experimental class. The IT teaching mode is adopted in the public English Teaching of higher vocational education. One is life science class with 63 students. As a control class, the traditional public English teaching mode is adopted in the public English Teaching of higher vocational education. The statistical results of the freshmen's English teaching results show that the total score $t = -0.268 < 2.000$, $P = 0.789 > 0.05$, teaching score $t = 0.073 < 2.000$, $P = 0.942 > 0.05$. There is no significant difference in the comprehensive language application capacity and teaching level between the two classes (as shown in Table 1), and the experiment can be conducted.

| Table 1. Comparison of entrance teaching results between the experimental class and the control class |
|-----------------|-------|-------|-----------------|-----------------|-------|-------|
| Class           | Number | Mean value | Standard deviation | Standard error | $t$   | $p$   |
| Total score of experimental class | 66    | 67.39   | 9.098            | 1.590           | -2.68 | .789  |
| Total score of control class    | 63    | 66.97   | 8.948            |                 |       |       |
| Total score of experimental class | 66    | 8.53    | 1.939            | 0.348           | 0.073 | .942  |
| Total score of control class    | 63    | 8.56    | 1.599            |                 |       |       |

Through one year's teaching experiment, the subject group staff will use SPSS17.0 to conduct independent sample t-test for the teaching results and total scores of the pre-test and post-test of the experimental class and the control class, respectively, to test whether there are differences in the relevant variables before and after the experiment and whether the differences are significant, and
analyze and discuss the reasons combining with the questionnaire survey results. The IT public English teaching mode in higher vocational education has significantly improved the students' Public English teaching level before and after the experiment. In this study, an independent sample t-test was conducted for the composition scores of the experimental class and the control class, and the results were shown in Table 2.

Table 2. Statistics of pre-test and post-test groups of composition scores in the experimental class and the control class

|                     | Number | Mean value | Standard deviation | Standard error |
|---------------------|--------|------------|--------------------|----------------|
| Control pre shift test | 63     | 8.56       | 1.899              | .239           |
| Control post shift test | 63     | 9.70       | 1.227              | .155           |
| Control pre shift test | 66     | 8.53       | 2.047              | .252           |
| Control post shift test | 66     | 10.74      | 1.293              | .159           |

Table 2 shows that the average score of composition in the experimental class is 10.74 and that in the control class is 9.70, with an increase of 2.21 and 1.14, respectively. The standard deviation of the experimental class is reduced from 2.047 to 1.293, which shows that the composition teaching level of the experimental class has improved comprehensively. Through the independent sample t-test of the pre-test and post-test of the composition scores in the experimental class and the control class, the improvement of the composition teaching level of the experimental class is significantly higher than that of the control class.

Analyze the learners. According to the characteristics of learners, the AI system can analyze them and set up personalized learning methods for them. Learners can use the Internet to learn at the right time. According to the results of its learning, AI calculates learners' mastery of knowledge, provides personalized exercises for further consolidation. Teachers can also analyze the effects of AI, adjust the teaching design, and set the key and tough points of the course. Design the right way to learn. Each learner's learning style and the ability to receive knowledge are different. According to the situation of learners, AI can select suitable learning content, set learning objectives, make personalized learning plans, breakthrough their learning difficulties, and provide different learning methods. Teachers can also adjust teaching methods and try to teach students according to their aptitude when teaching courses according to the test results of learners.

5. Conclusions

In conclusion, the information age has come, and AI has offered new opportunities to the education sector. After AI is integrated into higher vocational English teaching, it has begun to present the trend of multimodal development. The application of AI to higher vocational English teaching is conducive to students' understanding of their learning styles, using the AI platform and software to practice listening, speaking, reading, writing, and translation, etc., effectively to enhance their quality of learning. Teachers can also make students engaged more in teaching based on AI, understand each student's learning status, and provide personalized counseling. Curriculum reform is an issue we are facing. How to reform, what to reform, and what direction to reform are questions that we should think about as educators. The emergence of AI has driven the innovation of teaching model, changed the teaching approaches of teachers, updated the learning styles of students, and provided a new idea for curriculum reform.
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