The Application Research of Artificial Intelligence and Big Data Analysis Technology in University Foreign Language Teaching

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Abstract—In recent years, with the development of computer linguistics and artificial intelligence technology in the field of English education, the research methods and technical means of artificial intelligence big data analysis have been introduced into the research and practice of foreign language teaching. As a new element, artificial intelligence big data analysis provides a new approach and research perspective for foreign language teaching. In order to solve the problems of foreign language teaching resources sharing, optimizing teaching resources, improve the efficiency of foreign language topic teaching, and improving the interaction between teachers and students, based on the theoretical and practical research of foreign language teaching in colleges and universities, this paper uses artificial intelligence and big data technology, firstly classifies the artificial intelligence system of foreign language teaching in colleges and universities, secondly, it classifies the information technology of artificial intelligence in high school. The ability of information storage and information processing in college foreign language teaching is analyzed theoretically in computer language. The software and hardware design of the artificial intelligence information integrated system of college foreign language teaching is carried out. The results show that: relying on the design of the storage module and system server, the hardware design of the system is realized, and the software design of the system is realized based on the system running environment design and database design. Finally, the paper puts forward the countermeasures and suggestions for the development of AI in foreign language teaching.

1. INTRODUCTION (HEADING 1)

The rapid development of artificial intelligence (or AI) technology has brought great challenges to college English teaching. As an independent discipline, artificial intelligence appeared in 1956. At the beginning of the 21st century, with the rapid development of computing power and data volume, artificial intelligence moved from laboratory to market, rapidly penetrated into the whole field and triggered the fourth industrial revolution. With the deepening of the commercialization of artificial intelligence, the application of artificial intelligence in the field of teaching is growing explosively [1]. As a special computer program, artificial intelligence technology in College English teaching surge, so that its education and AI field has become a hot topic of experts.

Artificial intelligence technology is influencing and reforming the whole process of English teaching with a powerful posture, which makes it possible for teachers to improve teaching efficiency, confirm teaching objectives in depth, and design teaching contents according to differences. While injecting new life into traditional English teaching, the defects of AI in English teaching are also revealed. Let teachers face new challenges in teaching value orientation and teacher-student relationship. The correct
use of artificial intelligence technology, to bring new learning experience for students, is an important

task placed on English teachers by society. Traditional English teachers usually complete their teaching
tasks through blackboard or wall charts. The main teaching idea of this method is still based on the
traditional examination oriented education, and the teaching purpose has great utility. In the actual

teaching process, teachers are often the main object of teaching tasks, and the subject status of students
cannot be well reflected. This cramming teaching method makes students in a passive learning state, it

difficult to improve their learning ability, and the teaching quality of teachers is also greatly affected

[2].

With the growth of economic foundation, some new electronic equipment can penetrate into English
teaching. A large number of slides, recording, broadcasting and other equipment make the traditional
teaching mode close to the audio-visual teaching mode. English teachers begin to bring more detailed
recording or original sound broadcasting for students in class, so that students can get more learning
resources [3]. The use of these resources also greatly expands the teaching ideas of teachers. With the

advent of the Internet era, the teaching mode of teachers is gradually closer to digital teaching, and the
teaching concept of students as the main body of teaching has been realized to a great extent. With the
rapid development of network technology, multimedia and other teaching equipment are further
combined with students' real life, which not only brings students more convenient learning methods, but
also lays the foundation for the trend of more diversified development of English teaching. With the
continuous rise of technical strength, artificial intelligence has become the latest trend of the
development of science and technology in the world, and has formed a technological revolution in
many directions, even widely known as the fourth industrial revolution. Many new achievements in the
field of artificial intelligence, such as Alpha dog and robot "dark blue", have long been famous all over
the world [4].

2. RESEARCH OBJECT AND METHOD

On the basis of artificial intelligence and big data, this paper firstly classifies AI in college foreign
language teaching system; secondly, it theoretically analyzes the information storage and information
processing ability of artificial intelligence information technology in university English teaching;
finally, the paper designs the software and hardware of the information integrated system of artificial
intelligence in university English teaching. The main research methods are: artificial intelligence theory,
principle analysis, mathematical modeling, cybernetics and system theory, computer C++ language,
group simulation and other research methods.

3. RESEARCH RESULTS AND ANALYSIS

3.1. The systematic classification of artificial intelligence big data analysis technology in university
foreign language teaching

Internet + education has been developing rapidly in recent years, and innovative teaching modes such
as maker teaching, steam teaching, flipped classroom and blue ink cloud class have emerged in an
endless stream. Based on the upsurge of teaching reform such as cross-border teaching of design
thinking, the application of artificial intelligence in education has innovative meaning, aiming at
cultivating comprehensive talents [5]. This paper will analyze the development trend of the integration
of artificial intelligence and education, and divide the foreign language teaching of artificial intelligence
into intelligent auxiliary system, intelligent evaluation system and intelligent corpus system, so as to
provide a theoretical basis for the development of artificial intelligence in college foreign language
teaching.

a) Intelligent Tutoring System

Intelligent tutoring system is evolved from artificial intelligence teaching software through
algorithm, which simulates the teaching process of real teachers. It is composed of three parts: domain
model, student model and tutor model. Domain model is the core foundation of the algorithm and the
bridge of interactive data between tutor and student model, aiming at personalized guidance and service.
The system evolves appropriately through the internal algorithm, adjusts according to the current cognitive level of the model, and customizes personalized teaching services for students.

*b) Intelligent Evaluation System*

Teaching evaluation is a very important link in the teaching process. Students' mastery of knowledge and students' knowledge application ability are closely related to it. The intelligent evaluation system liberates teachers' labor and changes from traditional to scientific and intelligent. The computer evaluation system, especially the real-time feedback function, improves the effectiveness and accuracy of education, reduces the burden of teachers and provides assistance for the improvement of teaching methods.

*c) Intelligent Corpus System*

Corpus is widely used in computer linguistics, and it has been applied in reading teaching and research. Computer linguistics can provide a set of effective methods and tools for reading teaching research in Colleges and universities, so that people can make a more detailed, in-depth and specific description of the reading corpus. The research based on corpus big data can not only summarize the answers from individual phenomena, but also pay more attention to the conclusion of answers from numerous phenomena and the relationship between phenomena. In addition, the generality of the authenticity of the theory can be verified by empirical research. Reading teaching theory is no exception. Because the big data of corpus can accommodate the reading corpus of millions, tens of millions or even hundreds of millions of words, people can fully exemplify, verify or explain some reading teaching theories.

3.2. The implementation of artificial intelligence technology in foreign language teaching system

The research of artificial intelligence technology mainly includes the design and processing of products and equipment in artificial intelligence system. In the problem processing, the following two aspects are mainly used: (1) Intelligent symbols in artificial intelligence technology can complete information input and value comparison in time. (2) The ability of information storage and processing in artificial intelligence information technology. As shown in Figure 1.

![Figure 1. The application of artificial intelligence technology in teaching](image)

In the process of designing teacher module, the design content should not only include the maintenance of teachers' own information, but also the statistics of teachers' overall information. In the process of teacher information statistics, different workloads should be analyzed by different teacher titles. Through the analysis of the teacher information in the teaching management department, we can effectively analyze the management department, so as to provide design ideas for the application of teacher module management, enter teaching talents for the development of the school, and provide first-hand information. In addition, a school scheduling problem is the top priority of the school, the school scheduling staff should timely integrate the class, curriculum resources, so as to achieve the best position. Course scheduling mainly refers to the integration of the existing teaching resources under the premise of limited resources, so as to achieve more accurate allocation of teaching resources [6].
No matter which school in the course of scheduling, we should avoid the following situations: (1) A teacher can only take one course at a certain time. (2) A class can only take one course at a certain time. (3) The number of students in a class should be less than the capacity of the classroom. For the elements of course arrangement, class, course, classroom, time and classroom are expressed as follows:

- Class gathering: \( CL = \{cl_1, cl_2, cl_3, ..., cl_n\} \)
- Course gathering: \( CU = \{kc_1, kc_2, kc_3, ..., kc_n\} \)
- Teacher gathering: \( TE = \{te_1, te_2, te_3, ..., te_n\} \)
- Time set: \( TI = \{ti_1, ti_2, ti_3, ..., ti_n\} \)
- Classroom assembly: \( CR = \{cr_1, cr_2, cr_3, ..., cr_n\} \)

The teaching schedule problem = \( CL*CU*TE*TI*CR \), needs to find the suitable conditions to constrain when the conditions are satisfied, that is, the scheduling results. In the process of solving course scheduling by genetic algorithm, the individuals in TS set should be regarded as the course scheduling scheme. In the course scheduling, all the scheduling schemes are regarded as the whole population and operated. The specific representative codes are as follows:

```java
for(Ransetirst:zuqun)
{
    setRst(rst);
    if(rst.getJiyin()>bestJiyin)
    {// Set the best gene value
        bestJiyin = rst.getJiyin();
        if (y < bestJiyin)
        {x = changeX(rst);
            y = bestJiyin;
            gn = generation;}
    }
    if(rst.getJiyin()<worstJiyin)
    {// Set the worst gene value
        worstJiyin = rst.getJiyin();
        totalJiyin+=rst.getJiyin();}
}
```

3.3. Hardware design of university foreign language teaching resources storage module and information integrated system

In order to realize the real-time sharing of foreign language teaching resources, the widely used memory structure is adopted to design the storage module of foreign language teaching resources. The memory in the model is used to store the document information of foreign language teaching resources, including documents, teaching courseware and exercises. The storage module of foreign language teaching resources information storage system should create a folder according to the type of media materials, and then store the foreign language teaching resource information and documents describing the resource information in the corresponding folder [7].

In order to improve the security performance of the integrated management system of foreign language teaching resources information, the user is first managed with limited rights. When the user logs in to the management system, the management system will determine whether the user has the authority according to the user's real information. Based on the user's permission determination process, it is deployed in web server, database server and file content management system server. The information of foreign language teaching resources is obtained by using the memory mechanism model, and the storage module design of the system is completed [8]. So far, the hardware design of the system is realized. As shown in Figure 2.
3.4. Environment design and database software design of information integrated management system

The application of the integrated management system of foreign language teaching resources information needs to go through two stages of development and implementation. Each stage has different requirements for the operating environment. Before the development of the system, the development software suitable for system operation must be installed in the development environment built on the platform [9]. The system uses SQL Server database as storage platform. The running environment of the system must be combined with the use of code development tools and the installation of data storage software, so as to facilitate the debugging of the system. In the development environment of the system, it is necessary to install the browser that conforms to the system configuration, in addition to install the corresponding development plug-in the browser. The function of database in the system mainly includes the query, addition and deletion of data information. It can also jump to the background database of the system to access the required access data. After analyzing the function of the system, the entity of the system can be set as user, administrator, foreign language teaching resource information and information content. Through the description of the relationship between each entity in the database, it provides logical support for the foreground function and background management of the teaching resource information management system [10]. As shown in Figure 3.

![Diagram](image-url)
4. CONCLUSIONS
This paper aims to analyze the artificial intelligence technology in university foreign language teaching and the conclusions are as follows:

4.1. Correctly treat the effect of artificial intelligence on students' growth
In the face of the challenges of the artificial intelligence era, teachers should neither ignore nor be too nervous. Teachers should clearly complete the understanding of the advantages and disadvantages of artificial intelligence technology, in order to better serve students as a new teaching technology. From the perspective of students' development, the main role of artificial intelligence technology is to intervene and adjust students' cognitive ability and learning content. In the teaching process of applying artificial intelligence technology, teachers can coordinate the selection of learning objectives and the regulation of learning process. Through their own rich teaching experience, let artificial intelligence technology to complete the cultivation of students' emotion and thinking direction. Let students reduce the dependence on artificial intelligence technology, at the same time, they can complete their English learning in a more free and creative way.

4.2. The single restriction of teaching concept
The remarkable characteristics of artificial intelligence technology may lead to two extreme changes in the relationship between teachers and students. The first is that teachers gradually become the controller of students' learning life and lose the ability of autonomous learning. Through artificial intelligence technology, teachers can collect and analyze students' voice, expression and other information with high intelligence, so as to quickly complete the understanding of students. Through the analysis of students' behavior, teachers can easily put students under their own control and complete the highly precise control of students. Artificial intelligence technology, which is used to help students answer questions and solve puzzles and judge students' actual situation, has lost its significance because of teachers' high mastery.

ACKNOWLEDGMENT
This research was financially supported by the teaching reform research project for Jiangxi province in China (Grant NO. JXJG-18-47-2).

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