

The Application of Human-Machine Intelligent Interaction Technology in the Practice of Foreign Language Intelligent Education

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Abstract: Based on artificial intelligence interaction technology, which comprehensively utilizes natural language processing, artificial intelligence training, and information retrieval technologies, it can accurately analyze users' questions inputted using natural language and return accurate answers to users. Smart education is a new demand and realm of educational informatization, leading educational informatization to a new stage of development. The human-machine intelligent interaction technology has extensive application value in the practice of foreign language intelligent education, using speech recognition technology to analyze speech errors and provide feedback; Simulate natural language dialogues to provide students with language exchange opportunities; Provide a large amount of language materials to learn more grammar and vocabulary; Generate natural and fluent language to help improve writing and translation skills. The research results help to fully explore the role of artificial intelligence in enhancing foreign language intelligence education, truly unleashing the power of technology, and assisting innovation and transformation in foreign language teaching.

Keywords: Human Machine Intelligent Interaction Technology; Foreign Language; Intelligent Education; Practical Application

1. Introduction

With the continuous innovation and progress of technology, human-machine intelligence technology is gradually changing the way it interacts with computer systems. From simple command based operations to more intelligent and natural interaction methods, human-computer interaction is moving in a completely new direction. The human-machine intelligent interaction technology comprehensively utilizes technologies such as natural language processing, artificial intelligence training, and information retrieval, which can more accurately analyze users' questions inputted using natural language and return accurate answers to users. For natural language questions inputted by users, priority is usually given to problem similarity comparison in the common question library. If there are high similarity questions, the corresponding answers are returned to the user, which can greatly improve the efficiency of the system. If the user's input question cannot be found in the common question library, it is necessary to return the answer to the user through processes such as question understanding, information retrieval, and answer extraction.

Smart education utilizes new generation information technologies such as 5G, cloud computing, and artificial intelligence to create a new educational environment that is intelligent, perceptive, ubiquitous, and connected to things. By utilizing human-machine collaborative educational intelligence, a new form and model of education is formed. Smart education is a new demand and realm of educational informatization, leading educational informatization to a new stage of development. At the same time, the concept of "smart learning environment as the technical support, smart learning as the fundamental foundation, and smart teaching method as the catalytic guidance" in smart education promotes and leads the continuous development of research and practice in smart education. Artificial intelligence technology is an important driving force for promoting the in-depth development of research and practice in smart education[1]. In the era of artificial intelligence, there have been structural changes in the teaching environment, teaching methods, and teaching evaluation of foreign language education[2]. Through the deep integration of artificial intelligence and foreign language education, innovative foreign language teaching models, teaching methods, and learning methods truly

promote foreign language teaching reform and promote the innovative development of foreign language intelligent education.

2. Use Speech Recognition Technology to Analyze Speech Errors and Provide Feedback

People communicate emotions and convey information through speech. Therefore, the pronunciation and intonation of the target language are very important and directly affect communication effectiveness [3]. Phonetics are extremely important in foreign language learning. Phonetics, vocabulary, and grammar are the three major elements that make up a language. Phonics is the foundation of language learning, and the relationship between phonetics, vocabulary, and grammar is complementary. The correctness of pronunciation and intonation directly affects oral expression, and is more related to the spelling and memory of vocabulary, as well as the clear expression of grammatical and syntactic relationships. Correct pronunciation can help both parties in communication better understand each other. Therefore, learning phonetics well is the foundation of learning a foreign language well.

Firstly, there is a lack of phonological awareness. Many students do not understand that the length, pitch, and intensity of vowels can distinguish units of meaning, and their pronunciation is too casual, their speech speed is too fast, and the pronunciation of many phonemes is ambiguous. When encountering long sentence recitation, students often abandon phonetic rules such as linking, emphasizing, and weak reading, and use an average force to read each word with equal length and weight.

Secondly, the basic knowledge of phonetics is weak. People are not familiar with the distribution and function of vocal organs, and the understanding of the distribution and function of vocal organs is limited to the two resonant cavities of the oral and nasal cavities. People have low recognition of organs such as the tip of the tongue, anterior lingual, lingual end, posterior lingual, small tongue, upper gingiva, hard palate, and soft palate. Not knowing the correct pronunciation of certain phonemes is particularly evident when pronouncing consonants. Unable to proficiently grasp the rules of phonemic variations and not understanding the rule of "when adjacent plosives overlap in pronunciation, the previous plosive does not erupt", resulting in the retention of two plosives or complete swallowing during pronunciation. People are not familiar with the rule of "single syllable vowels have the longest duration, and stressed vowels have longer duration", and they are not paying attention to pronunciation methods such as "long vowels should be elongated, short vowels should be short and powerful, and double vowels should be full and round". Inability to accurately understand suprasegmental features such as stress, linking, weak pronunciation, rhythm, and intonation. Stress is a suprasegmental feature of discourse, reflected throughout the syllable, but not on individual independent vowels or consonants. The pronunciation of stressed syllables is stronger than that of unstressed syllables, which is more prominent in language flow.

Thirdly, the negative transfer effect of Chinese pronunciation habits. The "Comparative Analysis Hypothesis" suggests that language features similar to the first language are easy to acquire, while features with significant differences are difficult to acquire. Chinese belongs to the Chinese family of the Sino-Tibetan language family, while English belongs to the Germanic family of the Indo-European language family. The former belongs to ideographic writing, while the latter belongs to phonetic writing. These two languages have significant differences in pronunciation, tongue position, length, mouth shape, rhythm, and intonation. In terms of consonants, when encountering words that end with a consonant, some students will add a semi-vowel at the end of the consonant, mainly because Chinese pronunciation does not end with a consonant. In terms of vowels, for vowels with similar pronunciations between English and Chinese, students often unconsciously borrow similar vowel sounds from Chinese.

In foreign language learning, various phonetic problems are often encountered. To correct the problems in pronunciation, firstly, it is necessary to master phonetic knowledge from a theoretical perspective. Secondly, it is necessary to better understand the pronunciation organs and their roles in pronunciation. At the same time, it is necessary to repeatedly practice to correctly grasp and apply the pronunciation essentials, in order to achieve the goal of fluent communication and correct understanding. Human-machine intelligent interaction technology can also analyze voice errors and provide feedback. When students read foreign language materials aloud, they can use a speech recognition engine to convert their pronunciation into text, and then input it into a human-machine intelligence model to analyze students' speech errors and provide feedback. This technology is called

speech recognition technology. Another advantage of guiding students to use online resources to learn pronunciation knowledge and strengthening pronunciation practice is to use native speakers as templates and repeatedly imitate and practice, which can more effectively improve students' pronunciation level and ability[4]. In addition, human-machine intelligent interaction technology can also analyze text and generate feedback.

3. Simulate Natural Language Dialogues to Provide Students with Language Exchange Opportunities

The artificial intelligence language model is a text generation technology based on deep learning algorithms, aimed at simulating human language processing capabilities through training. This model can generate natural language that conforms to grammar and semantic rules by observing and learning human language patterns. By learning multiple languages, this model can translate one language into another while maintaining semantic and grammatical correctness. Artificial intelligence natural language processing mainly involves three levels of technology: lexical analysis, syntactic analysis, and semantic understanding. Lexical analysis mainly focuses on basic processing of text such as word segmentation and part of speech tagging; Syntactic analysis studies the structure and grammatical relationships of sentences; Semantic understanding involves the deep meaning and context of the text. Artificial intelligence natural language processing is widely used in various fields, including intelligent customer service, search engines, social media analysis, and machine translation. With the gradual application of intelligent robots in the field of education, the performance optimization of question answering and dialogue systems has always been the focus of artificial intelligence scientists[5]. A question answering system is a system used to answer users' questions. The design concept is that a computer is responsible for parsing and understanding natural language questions raised by users, and retrieving the most suitable answer from all currently collected question answering sets to return to users. At present, the accuracy of question answering system tasks based on natural language processing can surpass the baseline of human level and gradually reach expert level.

Lexical and syntactic analysis refers to the segmentation of words in a language, analyzing the semantic structure and part of speech [6]. Human language has a certain degree of fuzziness, but it is precisely based on this fuzziness that artistic language such as poetry has emerged. When humans use language to express themselves in daily life, they often carry a large amount of implicit information or implicit meanings. Correctly handling language ambiguity and hidden information is a challenge in natural processing. The use of lexical and syntactic analysis models can accurately solve these problems. The premise of lexical and syntactic analysis is to correctly segment the words in a sentence. Correct lexical and syntactic analysis is the foundation for processing language information. Language models train existing language and text materials to determine whether a given language and text material conforms to objective language expression habits. This is usually used for text correction or polishing of language and text content to improve the quality of language and text expression. Emotional analysis is an important application of natural language processing technology, which can analyze the emotions or emotions behind a paragraph of language and text content. After inputting a paragraph of language and text information, the results of emotional and emotional analysis will be obtained. Content prediction and generation are mainly used in machine translation, intelligent creation, and dialogue systems. Among them, machine translation is currently a relatively mature technology that can approach the level of human translation. Intelligent creation is currently mainly used for writing structured data, such as writing notifications and announcements. The dialogue system is currently mainly used in scenarios such as customer service and product after-sales feedback, and can be used to significantly reduce labor costs such as customer service.

Human machine intelligence can simulate natural language conversations and provide students with opportunities for language exchange. By engaging in human-machine intelligent conversations, students can improve their language communication skills while also receiving feedback and suggestions on grammar, pronunciation, and vocabulary. Human-computer intelligent dialogue provides a more natural and intuitive way of human-computer interaction. Compared to traditional human-computer interaction methods, using natural language for interaction is more intuitive, natural, and efficient, which can help people better communicate and communicate with computers. It can be done anytime and anywhere, making it convenient for students to practice speaking a foreign language; The human-machine intelligent speaking robot is American English, with a higher level of English pronunciation and no accent; Human machine intelligent speaking robots can answer various questions, making the learning process more rich and interesting; Can provide real-time feedback and guidance to help students understand basic knowledge, including grammar rules and pronunciation, as well as

answer complex problems encountered by students; It can simulate real situations, provide real-time feedback and personalized learning, significantly improving learners' learning effectiveness and oral expression ability.

4. Provide a Large Amount of Language Materials to Learn More Grammar and Vocabulary

Any language has its inherent grammar rules and rules. Grammar is the rule of word formation and sentence formation, the link between vocabulary and sentence formation, and an extremely important component of language. Grammar can be divided into two parts: morphology and syntax, which include the forms and changes of various words; Syntactic mainly teaches the types and types of sentences, sentence components, and the rules of word selection and sentence construction. There are many problems in the current teaching of foreign language grammar in universities. Teachers mainly use teaching methods such as grammar rules and practice questions. The teaching content is mainly based on textbook knowledge, but textbook knowledge is highly theoretical and difficult for students to accept. From the perspective of curriculum system arrangement, there is too much teaching content and too few teaching hours. In order to meet the needs of improving exam scores, it is necessary to increase exam oriented teaching content, which brings great pressure to grammar teaching. The teaching and learning methods are single, unable to stimulate students' interest, easy to generate resistance, and the efficiency of foreign language grammar teaching is low, which has become a bottleneck in teaching and a difficult point for students to learn. Human machine intelligence can flexibly create teaching scenarios. In the process of creating teaching scenarios, flexible choices and creations should be made based on different grammar content to stimulate students' interest, arouse their curiosity, and enable them to actively enter the scene for experience and learning[7]. In order to achieve better teaching results, induction and deduction methods are used to create complex and difficult to understand grammar knowledge and structures.

Vocabulary is the fundamental unit of language, maintaining phonetics and grammar, and is the building block of language. The foundation for cultivating language skills and enhancing language knowledge is the mastery and application of vocabulary[8]. The amount of information in vocabulary far exceeds that in other parts of the language, making it crucial for understanding language and speech output. Having a sufficient vocabulary, one can speak a large number of second languages even if they are not familiar with language structures. Linguist D. Wikins once believed: "Without grammar, people can express very few things; without vocabulary, people cannot express things. Learning a foreign language in a country lacking a language environment, without efficient vocabulary learning, the mastery of language knowledge is impossible, and the cultivation of communication skills will also become a passive source of water. Therefore, vocabulary is a main thread in the process of foreign language teaching, running through the entire foreign language teaching process. The effectiveness of vocabulary teaching has a significant impact on students' foreign language literacy and ability. Adequate vocabulary reserves can enable students to have the ability to independently understand the meaning of words, while also having a significant impact on their article translation and reading comprehension abilities. The use of human-machine intelligence technology to assist students in word learning can improve the interest of word learning, which is an important measure for innovation in foreign language education and teaching. Foreign language teachers should actively use human-machine intelligence technology when conducting word teaching, and use human-machine intelligence technology to reduce the difficulty of word teaching. Utilizing human-machine intelligence technology to enrich word teaching modes and change the basic form of traditional word teaching.

5. Generate Natural and Fluent Language to Help Improve Writing and Translation Skills

Natural language generation is one of the important research directions in the field of human-machine intelligence. In recent years, with the rapid development of deep learning technology, innovative applications in the field of natural language generation have attracted widespread attention. Deep learning enables machines to understand and generate high-quality natural language texts by simulating the neural network structure of the human brain. The working process of natural language generation starts from abstract concepts and gradually generates text through systematic grammar rules[9]. The principles of natural language generation mainly include language models and generation algorithms. A language model refers to the computer modeling of the statistical laws of language. By learning a large corpus, the computer can predict the probability of the next word appearing. The generation algorithm refers to the generation of text that conforms to grammar and semantic rules

based on the language model. Natural language generation technology will have broad application prospects in the future. Firstly, it can be used in the field of intelligent customer service to automatically answer common questions through robots, reducing the workload of manual customer service. Secondly, it can be used in the field of news reporting to improve reporting efficiency and accuracy through automated generation of news reports. In addition, natural language generation technology can also be used in fields such as literary creation, advertising design, and educational assistance. Human machine intelligence can generate natural and fluent language, helping students improve their writing and translation skills. It can also generate high-quality correction and modification suggestions through natural language generation technology, helping students improve their writing and translation skills.

Writing, as a form of written expression, is a comprehensive reflection of language proficiency and also a practical reflection of language learning level. Foreign language writing teaching emphasizes the training of students' writing skills, requiring them to grasp writing skills, clarify the meaning of the article, prepare sufficient evidence, conduct reasonable argumentation, and ensure the completeness of the discourse structure and smooth language expression. For a long time, there have been many problems in the teaching of foreign language writing in universities [10]. These problems are reflected in the classroom teaching process, manifested as knowledge introduction and skill training being often superficial; Reflected in the teaching application process, manifested as writing practice often being ignored; Reflected in the teaching evaluation process, manifested as meeting the proportion of passing students; Reflected in the response to the CET-4 and CET-6 exams, encouraging students to memorize model texts or memorize templates, neglecting innovative thinking. In the end, teachers focus their main energy on correcting their compositions, resulting in insufficient guidance and guidance before writing, inadequate effective supervision and personalized feedback during the writing process, and frequent errors in students' foreign language compositions. As the Internet brings humanity into a new era of big data, technologies such as human-machine intelligence continue to promote the in-depth development of educational platforms, promoting more accurate, intelligent, and efficient writing scoring systems. Artificial intelligence and big data have brought various changes to foreign language writing teaching, bringing new opportunities for the reform of foreign language writing teaching, and also promoting the birth of automatic essay scoring systems, improving the accuracy and intelligence of scoring results. Applying artificial intelligence to foreign language writing evaluation can evaluate new compositions based on the evaluation results of previous compositions, continuously improve the evaluation level through learning, and provide practical and feasible guidance plans for students. The teaching of foreign language writing based on artificial intelligence can help improve writing skills, especially in terms of writing motivation and fluency [11].

Reading, as an important way of language input, occupies an important position in foreign language teaching. Improving students' foreign language reading ability is not only the purpose of foreign language learning, but also a means to learn a foreign language well. It is also a way to test students' foreign language knowledge, cultural knowledge, thinking ability, and comprehensive information processing ability. It is also a necessary path for students to increase cultural knowledge, expand cultural horizons, strengthen humanistic cultivation, and improve self-learning ability. The application of artificial intelligence in foreign language reading teaching is mainly reflected in the following aspects [12]: firstly, an intelligent education platform based on artificial intelligence technology provides strong technical support for the foreign language reading classroom teaching environment, and provides accurate learning situation analysis for teachers before class. Teachers can not only clarify students' individual needs, but also accurately grasp the overall learning situation, Assist teachers in selecting more targeted teaching resources and methods. In the teaching process, simulation teaching models based on virtual reality technology and augmented reality technology bring immersive learning experiences and stimulate students' interest. The second is that artificial intelligence promotes communication and collaboration between teachers and students in the process of foreign language reading teaching, achieving spatiotemporal interaction and collaboration before and after class, optimizing discussion space, and achieving real-time on-screen communication. Educational robots can also participate in group discussions and exchanges. Thirdly, artificial intelligence has changed the traditional evaluation method of foreign language reading teaching, making the evaluation more targeted and scientific. The intelligent education platform and intelligent evaluation system can integrate various process and outcome data online and offline, making teachers' evaluation of students' reading ability more comprehensive. At the same time, teachers can also accurately evaluate students' reading proficiency and improve the effectiveness of teaching evaluation by repeatedly watching the audio or video submitted by students to the intelligent education platform, using speech recognition technology.

6. Conclusions

Smart education promotes educational modernization through educational informatization, and changes traditional models with information technology. It requires the support of a smart learning environment, the guarantee of a smart learning model, and the implementation of smart learning evaluation in order to cultivate intelligent talents with innovative ability and creative potential. Machine translation, natural language understanding, and speech recognition technologies in the field of artificial intelligence are all closely related to language learning. The increasingly mature integration of artificial intelligence and foreign language teaching contributes to the modernization of foreign language learning concepts and methods. The research results of this article contribute to fully exploring the role of human-machine intelligence in enhancing foreign language intelligence education, truly unleashing the power of technology, and assisting innovation and transformation in foreign language teaching.

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