

The Integration of Artificial Intelligence in Chinese Language Instruction

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Abstract: *In order to facilitate the adoption of artificial intelligence within the realm of Chinese language instruction and to achieve a profound integration of artificial intelligence technology with Chinese language pedagogy, this paper delineates the pivotal technologies involved in the deep integration of artificial intelligence technology and Chinese language teaching. It further elucidates their practical application in authentic educational contexts through illustrative examples. Additionally, the paper conducts an analysis of the prevailing state of artificial intelligence technology application within Chinese language teaching, delineating its principal functionalities and application scenarios, as well as scrutinizing the challenges associated with its implementation.*

Keywords: *Artificial intelligence; artificial intelligence education; Chinese language teaching; individualization education*

1. Introduction

The rapid advancement of internet, cloud computing, and artificial intelligence technologies has precipitated significant transformations within the educational domain. Numerous scholars have dedicated their research to the application of artificial intelligence within the realm of Chinese language instruction. Liu Xun believes that the smart campus learning environment, with educational robots at its core, supports the endeavors of educators and serves as a collaborative partner in the learning process, fostering an innovative pedagogical approach. Zhu Chaowei has developed a personalized educational assistant system known as AI Good Teacher, which leverages artificial intelligence to convert tacit educational experiences into explicit knowledge, offering tailored assistance to educators in addressing pedagogical challenges, providing professional educational counsel to parents, and serving as a considerate self-assessment advisor for students, thus achieving efficient education through human-computer symbiosis.

2. Artificial Intelligence (AI) concept

Artificial intelligence (AI), as a pivotal domain within computer science, concentrates on the investigation and advancement of theories, methodologies, technologies, and application systems that emulate or potentially exceed human cognitive abilities. It represents an interdisciplinary field that amalgamates diverse technological disciplines, with the objective of crafting intelligent machines

adept at executing intricate tasks, akin to computer applications that comprehend human intellect.

2.1. Core Technologies of AI

2.1.1. Cognition and Learning

Cognition and learning are the central functions of artificial intelligence, representing the most critical components in the study of AI. Artificial intelligence is a comprehensive interdisciplinary science that integrates knowledge and theories from various fields, including statistics, probability theory, computer science, system identification, and neuroscience. As a key area of AI research, machine learning is based on the theoretical foundation of probability and statistics, aiming to simulate the human learning and cognitive processes. Its goal is to extract potential knowledge from vast amounts of data, summarize and reconstruct the knowledge system, thereby enhancing system performance and solving various complex problems.

2.1.2. Language Recognition

The fundamental objective of natural language processing is to identify efficacious methodologies and tactics for facilitating human-computer interaction via natural language. This endeavor aims not only to empower computers with the ability to comprehend everyday human language but also to enable individuals to engage with computers using vernacular, thereby facilitating more facile and efficient information management. The primary application domains are expansive, encompassing, but not limited to, automatic translation, automated

reading comprehension, and intelligent question-and-answer systems, among others.

2.1.3. Human-Machine Integration

The primary objective of human-computer integration research is to investigate and refine the mechanisms governing information exchange between humans and computers. This encompasses a multitude of technological domains, including fundamental interaction, visual interaction, auditory interaction, emotional communication, body perception interaction, and direct brain-to-machine interaction. Notably, auditory interaction technology stands out, incorporating sophisticated technologies that facilitate communication with computers through natural human speech or machine-generated synthetic speech.

2.2. Artificial Intelligence (AI) in Education Applications

Within the educational domain, a significant metamorphosis propelled by artificial intelligence technology is currently unfolding. This metamorphosis extends beyond conventional pedagogical paradigms, penetrating to the very nucleus of educational practice, and introduces novel cognitive frameworks and pedagogical methodologies to the instruction of the Chinese language.

(1) Attain intelligent learning support. In the conventional Chinese learning paradigm, the learning pathways are typically singular and deficient in variety. Nonetheless, with the swift advancement of artificial intelligence technology, it has introduced a novel approach to intelligent learning support for Chinese scholars. Learners are now able to utilize an array of electronic devices, including smartphones, tablets, and laptops, thereby liberating themselves from temporal and locational constraints and enabling them to select the learning modality that optimally suits their preferences. The application of artificial intelligence technology not only facilitates comprehensive monitoring of the learning process but also empowers the system to autonomously evaluate and yield precise learning outcomes.

(2) Suggest solutions. In the course of conducting interpersonal communication teaching activities, it has been observed that teachers generally lack a standardized set of criteria for identifying and rectifying students' pronunciation and intonation errors. This discrepancy results in considerable variation in the tolerance for such errors. Concurrently, the learning environment may impede certain students' acquisition of standard

Mandarin pronunciation, thereby influencing their profound learning and comprehension of the Chinese language. To tackle these challenges, the integration of artificial intelligence technology, incorporating natural language processing and human-computer interaction, can be utilized to procure pronunciation feedback and conduct accuracy assessments via fundamental human-computer dialogue.

(3) Enhance the pedagogical approaches of educators. For those in the teaching profession, artificial intelligence technology is of paramount importance. It alleviates teachers from burdensome, monotonous, and repetitive cognitive tasks, serving as a potent instrument and ally in the educational process. The deployment of artificial intelligence within the educational domain has precipitated the emergence of a plethora of educational and learning products, including intelligent education platforms, intelligent learning software, and intelligent learning robots. Intelligent learning platforms have the capacity to augment teachers' pedagogical methodologies and support learners in their educational pursuits.

2.3. Practical Applications

The integration of artificial intelligence technology into the realm of Chinese language instruction not only broadens the learning horizons for pupils but also conserves precious time for educators and learners across three dimensions: pre-class preparation, in-class instruction, and post-class review. It enhances the efficacy of learning and effectively mitigates the challenges encountered by parents during the tutoring of their offspring.

2.3.1. Application Environment

Upon meticulous examination and contrast, it is evident that the prevailing applications of artificial intelligence within the educational domain are predominantly concentrated in several pivotal areas, encompassing but not limited to teaching platforms, intelligent learning environments, and intelligent robots. Specifically, the Chinese intelligent teaching platform epitomized by Baidu Chinese leverages an extensive Chinese language database and sophisticated Chinese language recognition technology to offer comprehensive and efficient personalized Chinese learning support to users. Such support not only facilitates learners in better managing their own learning progress but also enables a more profound comprehension of the core content of language learning.

2.3.2. Core Functions

In the realm of Chinese language instruction, the

integration of artificial intelligence has emerged as a significant trend. Its primary objective is to furnish robust support to educators and learners alike. Through the deployment of intelligent technology, instructors can efficiently manage and evaluate assignments, and can conduct more precise assessments of students' academic advancement. Additionally, they can provide tailored intelligent tutoring services, which significantly aid in mitigating the scarcity of high-quality educational resources. Presently, intelligent learning platforms such as "Happy Teaching and Learning" and "Xunfei Changyan" are available in the market. These platforms are capable of undertaking numerous repetitive teaching tasks, thereby aiding instructors in conserving valuable time and energy; simultaneously, intelligent technology can also assist learners in practicing oral communication and receiving intelligent guidance, and can monitor and document learners' progress in real-time.

3. Defects in the practical application of Artificial Intelligence (AI)

Researchers, including Chen Ming Liang, underscore that educational robots, when interacting with learners, frequently exhibit a deficiency in the capacity for emotional exchange and human-like dialogue. In light of the aforementioned analysis and discourse, the objective of this article is to undertake a thorough systematic review and detailed summary analysis across three principal dimensions: the fundamental content of Chinese language education, the execution of knowledge-based instruction, and the pedagogical competencies of educators.

Initially, within the contemporary domain of artificial intelligence, applications for the instruction of the Chinese language have not genuinely permeated the central aspects of pedagogy. Despite the plethora of Chinese educational resources available online, which are noteworthy for their diversity, it is imperative to highlight that due to the minimal barriers to entry and the absence of stringent content mechanisms on digital platforms, an influx of teaching materials of varying quality has ensued. The precision and profundity of these materials are frequently constrained, with numerous resources merely replicating textbook content. Secondly, there exists an undue emphasis on knowledge-based education. In the application of artificial intelligence technology to the teaching of the Chinese language, there is frequently an overemphasis on exam-oriented education, which results in the neglect of the cultural richness of the Chinese language and the

psychological and physical well-being of students.

Thirdly, there exists a necessity for teachers to enhance their pedagogical competencies. A considerable variance in proficiency is observed among Chinese language educators, with urban instructors typically exhibiting superior professional attributes compared to their rural peers. Certain educators lack requisite professional background knowledge, which diminishes the overall professional quality of the teaching cadre and detrimentally impacts the quality of Chinese language education. Despite a general improvement in the integration of information technology within pedagogy, there remains an imperative to bolster innovative, information-based instructional techniques.

4. Conclusion

Within the contemporary epoch, the domain of Chinese language pedagogy is progressively incorporating artificial intelligence technology, thereby affording customized learning support services across various dimensions of Chinese language education. Despite this trend, prevailing research endeavors are predominantly concentrated on technological development, with a notable deficiency in attention directed towards the fundamental issues and requirements of Chinese language education. In reality, the utilization of artificial intelligence within the realm of Chinese language instruction harbors substantial potential, which necessitates further exploration and exploitation. To fully leverage the advantages of artificial intelligence technology, it is imperative to engage in interdisciplinary collaboration, enhance the development of situational inquiry, and foster the evolution of human-computer cooperative teaching methodologies.

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