International Journal of Social Science and Human Research

**ISSN (print): 2644-0679, ISSN (online): 2644-0695**

Volume 08 Issue 05 May 2025

DOI: 10.47191/ijsshr/v8-i5-121, Impact factor- 8.007

Page No: 3937-3941

# A Comparative Study on The Teaching Assistance Capabilities of ChatGPT and DeepSeek in Primary School Chinese Education

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**ABSTRACT:** This study is conducted against the backdrop of the application of generative artificial intelligence technology in education, focusing on two prominent models: OpenAI's ChatGPT and DeepSeek developed by China's DeepSeek Company. A research methodology combining literature review and empirical testing is adopted to systematically evaluate these models. Through comparative experiments and case analyses in areas such as text comprehension, essay correction, instructional design, and classroom interaction, this paper investigates the technical distinctions and teaching adaptability of ChatGPT (GPT-4.5) and DeepSeek (Chinese-optimized) within the context of primary school Chinese language teaching. The findings indicate that ChatGPT demonstrates superior performance in terms of linguistic fluency, creativity, and diversity, whereas DeepSeek exhibits stronger capabilities in recognizing language teaching terminology, local cultural contexts, and foundational semantic understanding. This research recommends that primary school Chinese language teaching should adopt model selection strategies tailored to specific scenarios while emphasizing hybrid usage approaches to enhance teaching efficiency.

**KEYWORDS:** ChatGPT, DeepSeek, Chinese language teaching, artificial intelligence-assisted teaching, case analysis

## I. RESEARCH BACKGROUND AND SIGNIFICANCE

### 1.1 Trends in the Integration of Generative Artificial Intelligence and Education

Following the release of GPT-3, large language models have progressively integrated into various domains, including educational assessment, instructional design, and students' autonomous learning. As highlighted in UNESCO's "Report on the Application of Generative Artificial Intelligence in Education" (2023), AI is expected to substantially enhance teachers' professional support systems over the next decade, particularly in areas such as language learning and text processing.

### 1.2 Challenges of AI in Chinese Language Teaching

Chinese language teaching places significant emphasis on principles such as "having substance in speech," "having order in speech," and "having reason in speech." It is characterized by a high degree of cultural dependency, complex teaching scenarios, and diverse emotional expressions. In comparison to languages like English, the localization and adaptation of generative AI for Chinese language teaching present greater challenges due to the unique linguistic and cultural nuances involved.

## II. RESEARCH METHODS AND DESIGN

### 2.1 Model Version and Platform Selection

ChatGPT: Based on the GPT-4.5 architecture and using the OpenAI ChatGPT Pro version, it has a relatively high degree of Chinese optimization and supports conversation history.

DeepSeek: Developed by a domestic team, it optimizes Chinese semantics and teaching scenarios, and is tested using a web version and API interfaces.

### 2.2 Research Methods

This paper comprehensively adopts three methods: literature review, functional testing and case analysis. In the literature review section, systematically sort out the research progress and application trends of AI teaching assistants at home and abroad; In the functional test section, four key tasks of Chinese language teaching are designed: text comprehension, composition correction, teaching design, and classroom interaction. Standardized tests are conducted on the two models respectively. In the case analysis section, typical texts in primary school Chinese textbooks and real teaching segments were selected for AI-assisted simulation to evaluate the practical application effect.

## III. CASE ANALYSIS

### 3.1 Comparison of Text Comprehension Ability

Task One: Researchers selected excerpts from primary school Chinese texts such as "The White Goose" and "The Harmony between the General and the Prime Minister" published by the People's Education Edition and asked ChatGPT and DeepSeek questions, such as "The personality traits of the characters in the text" and "The basis for the division of paragraph levels".

Result: Both models can complete the basic text analysis tasks relatively accurately and have good text understanding capabilities.

Conclusion: The responses of ChatGPT are detailed and the language expression is natural, but sometimes the teaching logic of the textbook arrangement is ignored. DeepSeek is better at grasping the terms of teaching materials and teaching orientations, and its answers are closer to the teaching intentions and in line with the teachers' preconceptions.

Task Two: The researcher selects the lesson "White Goose" and requires two models to analyze the description of the goose's movements.

The result: ChatGPT can associate the descriptive styles of other animals and provide comparative analysis ideas, while DeepSeek accurately points out that "shaking its head and wagging its tail" and "walking with its head held high" reflect the goose's arrogance, which is in line with the teaching objectives.

Conclusion: ChatGPT has a relatively strong ability of association and comparative analysis, and DeepSeek is more in line with the localized teaching approach in terms of details and knowledge points.

### 3.2 Essay Correction Tasks

Task One: Have two models respectively correct a primary school student composition titled "My Mother". Input the two models and evaluate them from three aspects: structure, language and content.

Result: ChatGPT focuses on language style and structural suggestions, and can identify and optimize problems such as sentence repetition and semantic ambiguity. DeepSeek places more emphasis on grammar correction and semantic clarity, and can provide clear modification suggestions for "language errors".

Conclusion: ChatGPT is suitable for enhancing the level of language expression, while DeepSeek is more appropriate for beginners to provide basic writing guidance.

Task Two: Select three picture-based essays written by third-grade students, input two models, and evaluate them respectively from the aspects of structure, language and content.

Result: One composition wrote, "The rabbit sat on the ground and listened to the little bird singing." ChatGPT suggests enriching the background and plot by adding a description of the "forest environment". DeepSeek, on the other hand, suggests that "using the verb 'squat' is more accurate", which is more targeted and operational.

Conclusion: ChatGPT offers numerous optimization suggestions in terms of language refinement and logical structure, and can even regenerate complete model essays. DeepSeek's modifications are more in line with the expression level of primary school students. It often retains the original language and only provides suggestive guidance on sentence structures and punctuation.

### 3.3 Teaching Design auxiliary tasks

Task: Taking the teaching design of the lesson "The Bird on the Boat" as an example, input the text and teaching objectives, and require the two models to output the teaching design.

Result: In response to the goal of "guiding students to experience the descriptive techniques of objects", ChatGPT suggests designing an activity of "multimedia presentation + imaginative writing", while DeepSeek recommends adopting the strategy of "asking questions sentence by sentence - summarizing on the blackboard", which is conducive to classroom operation. ChatGPT offers comprehensive teaching objectives, activity designs, and student participation plans in various forms, such as role-playing and creating dialogues, which are creative and logically complete. DeepSeek, on the other hand, has a more regular output structure, embodying a four-step teaching method of "introduction - reading and speaking - practice - summary", which is in line with the teaching routine. It performs outstandingly in key and difficult teaching points as well as after-class extension sessions, demonstrating a strong alignment with the curriculum standards.

Conclusion: ChatGPT is suitable for generating heuristic and inquiry-based instructional designs, and DeepSeek performs exceptionally well in terms of structural norms and alignment with the teaching syllabus.

### 3.4 Classroom Interaction Ability

Task: Through simulating teaching scenarios, conduct interactive tests on some of the problems that occurred in the classroom recording of "White Goose", and observe the interactive responses of the two models.

Result: When students asked, "Is' arrogance 'a derogatory term?", ChatGPT distinguished between positive and negative usages and provided rich examples. DeepSeek, in combination with the textbook, explains "Here it is neutral to positive" and suggests that teachers can design word discrimination activities.

Conclusion: ChatGPT often approaches from the perspective of writing, encouraging students to expand their associations.

DeepSeek focuses on guiding students to return to the text and find the basis for the answers.

## IV. ANALYSIS AND IMPLICATIONS

### 4.1 Advantages and Limitations of ChatGPT

Advantages: Natural language generation, clear logic, and strong cross-disciplinary association ability.
Limitations: Misunderstandings of some terms and lack of adaptability to cultural contexts.

### 4.2 Advantages and Limitations of DeepSeek

Advantages: Strong localized vocabulary, in line with curriculum standards, and precise semantic analysis.
Limitations: The way of expression is slightly stiff, lacking flexibility and creativity.

### 4.3 Comprehensive Comparison and Adaptation Suggestions

Comprehensive comparison shows that ChatGPT is more suitable for open-ended tasks such as creative writing and extended reading. DeepSeek is more suitable for closed tasks such as basic Chinese teaching, examination point guidance, and intensive text reading. The suggestions are as follows:

(1) Task-oriented selection: When the teaching objective focuses on generating output and language innovation, ChatGPT is preferred. When focusing on training key points and understanding texts, DeepSeek is preferred.

(2) Mixed usage strategy: In the early stage of teaching, use ChatGPT to stimulate interest; in the middle stage of teaching, use DeepSeek to assist in implementation; and in the later stage of teaching, combine the two for expansion training.

(3) Teacher intervention mechanism: AI suggestions need to be reviewed and filtered by teachers to ensure that the scientific nature of teaching is in harmony with children's psychological development.

### 4.4 Optimization Directions of AI-Assisted Chinese Language Teaching

(1) Enhance cultural adaptability

(2) An open and co-created teacher training mechanism

(3) Transparent and traceable generation logic

## V. CONCLUSION

Through a systematic comparative study of the auxiliary capabilities of the two generative artificial intelligence models, ChatGPT and DeepSeek, in primary school Chinese teaching, this paper finds that both have their own advantages in language generation logic, cultural context adaptation, and teaching strategy suggestions, and exhibit different teaching adaptation characteristics.

Specifically, ChatGPT has significant advantages in handling teaching tasks that require divergent thinking and creative expression, especially in areas such as composition training, topic expansion, and reading extension. Its language generation has a high degree of fluency and expression diversity, which helps to stimulate students' language imagination and interest in expression. DeepSeek, due to its deep integration with the local teaching material system and precise grasp of Chinese language terms, is more suitable for undertaking basic Chinese language teaching tasks such as intensive text reading, understanding of key words and sentences, and extraction of examination points, and can better assist teachers in achieving teaching goals.

For primary school Chinese teachers, this study suggests that models should be reasonably selected based on the teaching stage and task attributes: ChatGPT can be used in the stage of teaching introduction and interest stimulation to enhance students' language participation. In the stages of knowledge explanation and implementation, DeepSeek can be given priority to strengthen the mastery of knowledge points. In the stage of teaching extension and comprehensive improvement, the coordinated use of the two can be considered to build a multi-level and multi-dimensional Chinese learning support system. At the same time, the leading role of teachers cannot be ignored. The content output by AI should be screened and processed by teachers to ensure the professionalism and age-suitability of teaching.

In the future, with the continuous evolution of artificial intelligence technology, the role of AI teaching assistants in primary school Chinese teaching will become more diverse. The continuous optimization of local models, the improvement of teachers' digital literacy, and the exploration of the "human-machine co-teaching" mechanism will be the key paths to promote the high-quality development of primary school Chinese teaching.

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