

Smart Teaching in International Chinese Education: A Case Study on the Use of Generative AI

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ABSTRACT

Objective: In the context of accelerating global educational digitalization, international Chinese education is facing both new opportunities and structural challenges. Among emerging technologies, Generative Artificial Intelligence (AI) is reshaping the dynamics of teaching design, learning interaction, and cultural transmission. This study aims to examine the theoretical implications of integrating generative AI into international Chinese language instruction, emphasizing its role not only as a pedagogical tool but also as a cognitive and cultural mediator. **Method:** Utilizing a qualitative, theory-driven methodology, the research constructs a conceptual framework based on Actor-Network Theory, Inter-subjectivity, and the theory of productive forces. The paper proposes a “technology–culture–education” triadic model to analyze how generative AI redefines teacher-student relationships, cross-cultural dialogues, and knowledge production. **Results:** Findings suggest that generative AI can personalize learning, enhance linguistic immersion, and promote educational equity across borders, while also challenging traditional power dynamics in classroom discourse and pedagogical agency. **Novelty:** This work contributes to the theoretical foundation for reimagining smart pedagogy in the field of international Chinese education.

INTRODUCTION

With the rapid development of artificial intelligence technologies and their increasing integration into educational settings, the concept of “smart education” has become a core topic in contemporary educational reform. As a strategic pillar of China’s global cultural outreach, international Chinese education is also seeking pedagogical innovation and theoretical reconstruction. Generative AI, with its capabilities in language generation, visual reconstruction, and interactive feedback, is widely applied in instructional content creation, writing assistance, and voice-based interaction. These technologies are driving international Chinese language teaching toward a more personalized, immersive, and data-driven trajectory. This study aims to explore how generative AI reshapes pedagogical models in international Chinese education and to reflect on the theoretical issues it raises, while proposing directions for future development.

Although recent studies have investigated the use of AI in language education, they primarily focus on evaluating technological performance and tool functionality. There is still a lack of theoretical reflection on how AI reshapes the value of education, mechanisms of teaching, and modes of knowledge construction, especially in cross-cultural contexts. In international Chinese education, teaching content not only involves language acquisition but also functions as a vital channel for cultural transmission,

necessitating an analytical perspective that integrates technology, culture, and educational innovation.

The introduction of generative AI reconfigures not only the logic of teaching content production but also disrupts the traditional structure of “teacher-led and student-passive” instruction. It gives rise to complex relational networks of teacher–student interaction, cultural construction, and cognitive engagement, mediated by intelligent systems. These transformations call for more than technical adaptation—they require profound theoretical rethinking.

This study, drawing on the theories of New Productive Forces, Actor-Network Theory (ANT), and Inter-subjectivity, constructs a “technology–culture–education” triadic model to address the following research questions:

What are the critical roles of generative AI in international Chinese language instruction? How does AI reshape teaching organization and knowledge dissemination in intercultural contexts? How are pedagogical subjectivities reconstructed within the coupling mechanism of “human–technology–culture”?

Adopting a qualitative methodology that combines theoretical deduction and literature analysis, this research attempts to bridge macro-level structures and micro-level practices, offering a systematic framework for future pedagogical transformations and theoretical innovation in international Chinese education.

Theoretical Framework

(1) Theory of New Productive Forces

The theory of new productive forces serves as an important foundation for understanding transformations in social structures and labor organization in contemporary society. In the context of education, AI technologies are no longer merely auxiliary tools but are increasingly embedded in knowledge production, learning pathways, and educational governance. They thus represent a form of “intelligent productivity.” This study draws on this theoretical perspective to analyze how generative AI empowers teaching practices and transforms the labor dynamics within educational environments.

(2) Actor-Network Theory (ANT)

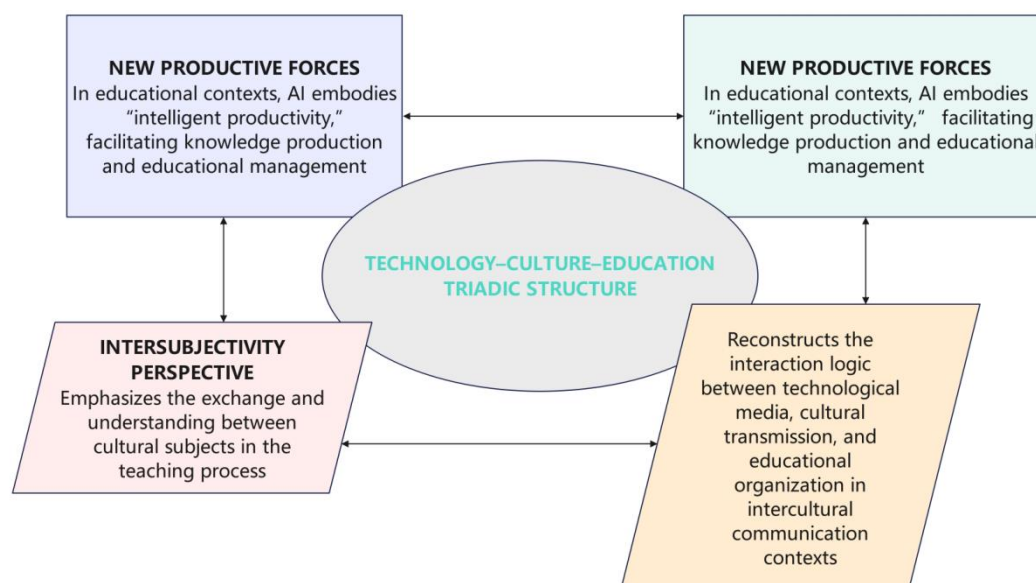
Actor-Network Theory emphasizes the dynamic interactions between technology, institutions, organizations, and human actors. In international Chinese education, teachers, students, AI platforms, and cultural resources together form a knowledge dissemination network. Generative AI, as a non-human actor, participates in the construction of this network, thereby reshaping the organizational logic and interaction mechanisms of traditional classrooms.

(3) Perspective of Inter-subjectivity

The cross-cultural nature of international Chinese education demands a strong emphasis on mutual understanding and communication among cultural subjects. The integration of generative AI into teaching may alter the original teacher–student interaction logic and provoke philosophical discussions regarding pedagogical subjectivity and the mechanisms of meaning construction in educational communication.

(4) The “Technology–Culture–Education” Triadic Structure

Based on the above theoretical perspectives, this paper proposes a conceptual model of the “technology–culture–education” triadic structure. It argues for the reconstruction of the interactional logic among technological mediation, cultural transmission, and educational organization, particularly in the context of cross-cultural communication.



Literature Review

(1) Current Research on Generative AI in Language Education

In recent years, with the emergence of generative AI platforms such as ChatGPT and Midjourney, the application of artificial intelligence in language education has become a key topic in educational technology research. Studies have shown that generative AI possesses capabilities such as language generation, semantic recognition, and interactive feedback, making it useful in supporting writing, speaking training, and personalized learning in language acquisition. For example, Du Min and Zheng Dongxiao point out that the introduction of generative AI not only improves the efficiency of language input and output, but also facilitates intelligent regulation of the learning process, signaling a transition in international Chinese education toward “smart-synergized” development [1].

(2) Trends and Challenges in the Smart Transformation of International Chinese Education

According to the Qingni academic report, since 2020, keywords such as “digital intelligence,” “platform,” and “personalized teaching” have appeared with increasing frequency in publications related to international Chinese education. This indicates that educators and policymakers are paying considerable attention to the transformative potential of digital technologies. However, research also reveals that most current applications of smart technologies remain at the level of content transmission and system integration, lacking in-depth analysis of teaching organization, discourse relations, and cultural interaction mechanisms. Lv Xinying and Shen Zhuangjuan note that the inherent

tension between standardized evaluation models and the flexibility of generative AI calls for a deeper theoretical response [2].

(3) Research Gaps and Theoretical Breakthroughs

Two prominent gaps exist in current scholarship: first, there is insufficient understanding of the mechanisms through which generative AI participates in constructing teacher-student subject relationships; second, there is a lack of systematic discussion on how AI functions as a “cultural mediator” in cross-cultural educational contexts to facilitate the dual transmission of language and culture. Zhao Yang emphasizes the need to strengthen theoretical reflection on inter-subjectivity in international Chinese education, highlighting the importance of cultural empathy, identity negotiation, and the co-construction of understanding in the teaching process, which provides a philosophical foundation for exploring AI-mediated educational interactions [3].

Furthermore, Wu Yinghui and Liang Yu stress the importance of reconstructing the knowledge system of international Chinese education from an interdisciplinary perspective, advocating for a focus on the collaborative logic among AI, language, culture, and education [4]. Su Ruohan and Yang Qing, using knowledge graph analysis, point out that current studies on AI integration in international Chinese education still exhibit fragmentation across the dimensions of language comprehension, instructional design, and cultural communication [5]. At the policy level, Jiang Guoquan and others argue that the smart development of international Chinese education must simultaneously serve national educational strategies and enhance China’s cultural soft power [6]. In addition, Guo Jing's statistical analysis of literature from 2017 to 2019 reveals a rapid rise in attention to the cross-cutting theme of “generative technologies and international communication,” reflecting the empirical foundation for AI’s role in Chinese language education research [7].

Therefore, this study adopts a theoretical approach to construct a conceptual framework involving “new productive forces,” “actor-network theory,” and “inter-subjectivity,” in order to systematically explore how generative AI participates in knowledge construction and interaction mechanisms in international Chinese education. The paper further argues that generative AI functions not only as a tool in teaching, but also as a key agent in meaning negotiation, cultural symbol reconstruction, and cognitive restructuring among teaching subjects. In multimodal teaching scenarios, it triggers new interpretations of education and redefines the logic of cultural transmission.

RESEARCH METHOD

This study adopts a qualitative, theory-oriented approach, focusing on theoretical analysis and integrative literature review to explore the mechanisms through which generative artificial intelligence (AI) participates in instructional reconstruction and knowledge dissemination within international Chinese education.

(1) Research Approach

This research is categorized as a qualitative, theory-driven study, emphasizing logical deduction and critical reflection based on existing theories. Through systematic literature review and theoretical inference, the study identifies the roles and functions of generative AI in the context of international Chinese education and contrasts them with classical and emerging models in educational technology. Such an approach is widely employed in theoretical construction within educational innovation research, offering high explanatory power and conceptual generalizability [8].

(2) Data Sources and Analytical Framework

The primary data sources include:

- a. The Qingni academic database report on research trends in international Chinese education;
- b. Relevant scholarly literature published in CSSCI and Peking University core journals from 2020 to 2025 on topics such as generative AI, digital education, and international Chinese instruction;
- c. Representative international studies on MOOC, SPOC, and AI-assisted teaching—such as Pappano’s *The Year of the MOOC* [9] and Jordan’s research on completion rates and learner engagement in online learning environments [10].

The analysis combines thematic categorization with theoretical deduction. The literature is first coded and organized according to key terms, conceptual logic, and theoretical lens; then, guided by the proposed “technology–culture–education” triadic framework, the paper deduces how AI participates in both language teaching and cultural transmission, ultimately generating an explanatory model.

(3) Theoretical Construction and Research Steps

Based on the three theoretical foundations—New Productive Forces, Actor-Network Theory (ANT), and Inter-subjectivity Theory—this study constructs its analytical model across three levels:

Educational Productivity Dimension: Drawing on the theory of new productive forces, the study analyzes how generative AI acts as a “new educational laborer,” engaging in instructional content production, assessment system design, and learning regulation [2].

Educational Network Dimension: Applying ANT, the research explores how AI, as a non-human actor, embeds itself into instructional systems and reshapes the interaction structures and knowledge flows between teachers and students [4].

Cultural Cognition and Construction Dimension: Incorporating inter-subjectivity theory, the paper examines how AI-mediated interactions influence identity negotiation, mutual understanding, and the symbolic reconstruction of culture in cross-cultural teaching scenarios [3].

Additionally, the study refers to classical educational technology models (e.g., SPOC integration in smart platforms) to extract applicable instructional design strategies and development pathways tailored for international Chinese education.

(4) Methodological Stance

In the rapidly evolving landscape of educational technology, this study underscores the need for a systematic understanding of the “technology–culture–education” nexus. It argues that theoretical insight is essential to uncover the epistemological shifts and cultural implications brought about by the integration of generative AI in teaching. The goal is to offer a robust conceptual foundation to support the smart transformation of international Chinese education.

RESULTS AND DISCUSSION

This chapter analyzes how generative AI technology intervenes in and reconstructs the instructional model and cultural communication mechanism in international Chinese education. Drawing on the theoretical framework proposed earlier and insights from the Qingni academic report, the discussion is developed along three dimensions.

(1) Pedagogical Participation of Generative AI: From “Tool” to “Subject”

Traditional educational theories often view technological tools as external aids to the teaching process. However, generative AI, with its capabilities in language generation, semantic understanding, and intelligent feedback, is increasingly embedded into the entire instructional cycle. It functions as a “collaborative participant” that influences teaching rhythms, feedback mechanisms, and personalized learning paths. According to the Qingni report, features such as AI-enabled personalized learning, voice interaction, and instant content generation have transformed classroom relationships from one-way transmission to multidirectional interaction. This transformation not only enhances instructional efficiency but also redefines the roles of teachers, students, and platforms.

(2) Cultural Communication and Algorithmic Restructuring

International Chinese education involves not only language instruction but also the dissemination of Chinese culture. The integration of generative AI inevitably triggers the reconstruction of cultural meanings. The Qingni report highlights AI’s role as a “cultural mediator” in content generation and contextual adaptation. While AI can reinforce specific cultural symbols, it may also overlook deeper cultural logics embedded in context. Therefore, educators must develop strong cultural critical awareness to mitigate the risks of “decontextualization” and “stereotyping” in AI-mediated cultural dissemination and to foster a humanistic and context-sensitive instructional system.

(3) Theoretical Framework Evaluation and Extension

The proposed “technology–culture–education” triadic framework has demonstrated strong explanatory power in analyzing the role of generative AI in international Chinese education. From the perspective of new productive forces theory, AI acts as an “intelligent laborer,” contributing to the production of educational content and restructuring of instructional systems. From Actor-Network Theory, AI platforms, as non-human actors, embed themselves in the teacher–student–resource network, forming new interaction models driven by algorithmic logic. From the standpoint of inter-subjectivity theory, AI-mediated multimodal interactions provoke new identity

negotiations and cultural understandings, challenging traditional teacher agency and interpretive authority.

In summary, the intervention of generative AI in international Chinese education is not merely a technological innovation, but a profound restructuring of participant roles, instructional contexts, and cultural transmission mechanisms. Moving forward, it is crucial to continually reflect on the human-machine-culture relationship and construct a new instructional ecology adapted to intelligent collaboration.

CONCLUSION

Fundamental Finding: This study explored the role of generative AI in international Chinese education from theoretical perspectives, including the Theory of New Productive Forces, Actor-Network Theory, and Inter-subjectivity. It concludes that AI is transitioning from a “technological tool” to an “active participant” in teaching—reshaping pedagogical relationships, cultural mechanisms, and educational structures. In summary, generative AI is reshaping the roles of participants, discourse patterns, and cultural frameworks in international Chinese education. Beneath these changes lies a deeper cognitive and pedagogical transformation. **Implication:** Enhance teachers’ critical AI literacy and cultural awareness. Teachers should not only master the technical use of AI but also understand its cultural encoding mechanisms to prevent the risks of decontextualization and stereotyping in AI-mediated cultural dissemination. Promote the deep integration of culture and technology. Course design should align with core themes of Chinese cultural communication and leverage AI’s content generation features to achieve both efficient instruction and creative cultural expression. Advance coordinated development of intelligent education platforms. Based on Qingni report recommendations, efforts should focus on interconnecting data, content, and resources across platforms to enhance system-wide service delivery in international Chinese education. **Limitation:** While the study presents a robust conceptual framework for understanding the integration of AI in international Chinese education, it remains primarily theoretical. The conclusions, while insightful, are based on theoretical constructs rather than empirical validation. As such, the risks associated with decontextualization and stereotyping, or the full potential of coordinated platform development, are discussed in normative rather than evidence-based terms. **Future Research:** Strengthen theoretical construction of AI-enabled education. Theoretical inquiry into the AI-human-culture relationship in cross-cultural teaching is needed to advance research on ontological and interactional dimensions of AI in education. Future research should incorporate empirical data to explore how generative AI affects learning outcomes, motivation, and cultural reception—shifting the field from mere “technological integration” to “intelligent symbiosis.”

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