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Digital Intelligence Empowers International Chinese Language Teachers' Development: Construction of Competence Improvement Framework and Resource Platform

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Abstract

In the post-pandemic era, the digital transformation of international Chinese language education is urgent, and teachers face issues such as uneven competence in applying digital intelligence technology and mismatched resources. This study surveyed 370 international Chinese language teachers and found that while their use of digital resources has become routine, it lacks depth. To address this, the study, combining the *Standards for Professional Competence of International Chinese Language Teachers* and the TPACK theory, constructs a "three-stage and nine-dimensional" competence improvement framework and designs an integrated international Chinese language digital resource platform with four modules—resource supply, training, interaction, and feedback—providing support for teachers' digital intelligence-driven development and the high-quality development of Chinese language education.

Keywords: international Chinese language, teacher development, digital intelligence, platform construction

1. Introduction

In the post-pandemic era, the global pattern of language and cultural communication and the development environment of international education have undergone profound changes. "Internet + Education" has become an important strategy to promote educational modernization and build a powerful education country. As a bridge for cultural exchanges between China and foreign countries, the digital transformation of international Chinese language education is not only key to its own high-quality development, but also an important measure for China to build a Digital China and a powerful education country. Currently, although international Chinese language education in the new era has entered a stage of high-quality and connotative development, the construction of teaching resources still faces challenges such as uneven quality of teaching materials, insufficient applicability, and inadequate technology integration. At the same time, with capabilities in data processing, intelligent analysis and personalized services, digital intelligence

technology provides new possibilities for the professional development and teaching innovation of international Chinese language teachers. Li Baogui et al. (2025) pointed out that data elements can inject new impetus into the high-quality development of international Chinese language education by reshaping teachers' roles and optimizing resource allocation (Li, B. G., & Li, H., 2025). However, teachers still face problems such as uneven competence in applying digital intelligence technology, mismatched resources, and incomplete support systems. Therefore, building a systematic digital intelligence competence improvement framework and an integrated intelligent resource support platform has become an urgent need to promote the professionalization and digitalization of international Chinese language teachers.

2. Theoretical Foundation and Research Framework

This paper aims to construct a theoretical and analytical framework for the research on the professional development of international Chinese language teachers empowered by digital intelligence. First, we will define the core connotation of teachers' professional development, and clarify the key dimensions of teachers' competence by combining the authoritative standards of international Chinese language education; second, we will explore how digital intelligence technology empowers teachers' professional development, and finally construct an integrated analytical framework to guide subsequent research.

2.1 Theoretical Foundation

Traditional teacher development models face obvious limitations in the context of the new era; previous research and practice have mostly focused on offline phased training, which is restricted by time, space and costs, and it is difficult to integrate digital education strategies (Goktas, Y., 2015). Teacher Professional Development (TPD) is a dynamic and continuous process, whose core lies in promoting the simultaneous improvement of teachers' knowledge, skills, teaching beliefs and independent development capabilities (Darling-Hammond, L., Hyler, M. E., & Gardner, M., 2017). In the field of international Chinese language education, teachers' professional development is directly related to the quality of teaching and the effect of cultural communication. The Standards for Professional Competence of International Chinese Language Teachers (referred to as the Standards) divides teachers' professional competence into four dimensions: language knowledge and skills, teaching knowledge and skills, intercultural communication, and professional ethics and professional development. It provides a core basis for teachers' self-assessment and career planning, and this study is based on these standards to explore the supporting role of digital means in helping teachers meet the standards.

To better understand how technology can effectively empower teaching, this study introduces the Technological Pedagogical Content Knowledge (TPACK) framework as a core theoretical tool. First proposed by Mishra and Koehler in 2006, this theory expands the traditional teaching knowledge framework and emphasizes the complex interaction and integration among Technological Knowledge (TK), Pedagogical Knowledge (PK), and Content Knowledge (CK) (Mishra, P., & Koehler, M. J., 2006). The framework argues that truly effective technology-integrated teaching is not a simple combination of these three types of knowledge, but rather teachers' ability to creatively integrate technology, pedagogy, and subject knowledge according to specific teaching content and contexts. For international Chinese language teachers, the application of the TPACK framework means their professional competence needs to achieve synergy in three aspects: they must not only have solid knowledge of Chinese language and culture (CK) and effective second language teaching strategies (PK), but also proficiently master and properly use various digital tools and platforms (TK) to optimize teaching design, innovate interaction modes, and ultimately improve the overall quality of teaching.

2.2 Research Framework

Based on the above theories, this study constructs an integrated analytical framework that combines the Standards and the TPACK framework, aiming to systematically guide subsequent data collection and the construction of the resource platform.

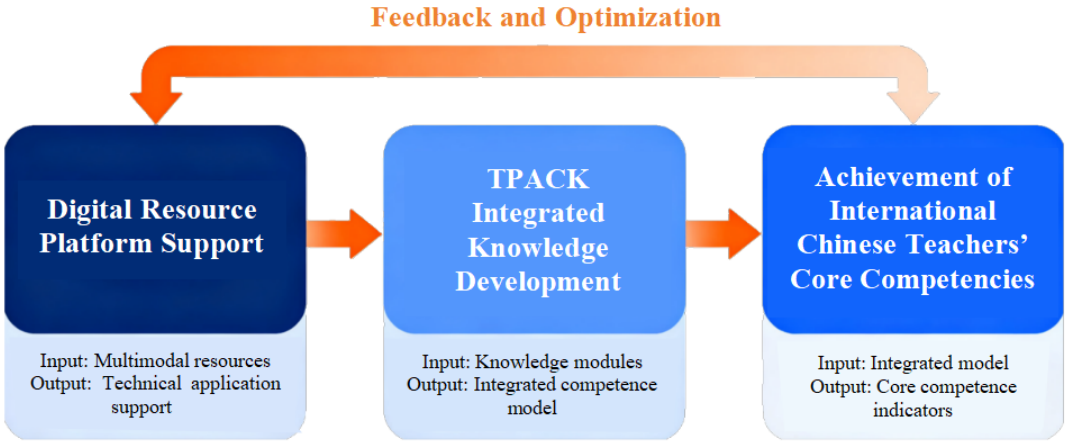

Figure 1. Framework of Core Competence Development Process for International Chinese Language Teachers

This framework is divided into three layers: core, middle, and outer. The core layer is the core competence of international Chinese language teachers, which directly corresponds to the four professional competence dimensions specified in the Standards and serves as the ultimate goal of teachers' professional development; all technology empowerment designs must be oriented toward the achievement of these competences. The middle layer is TPACK integrated knowledge, which acts as a bridge connecting competence goals and technology empowerment, emphasizing that teachers need to develop integrated TPACK to adapt to the digital intelligence teaching environment. The outer layer is the digital intelligence resource platform support system, i.e., the international Chinese language digital resource platform planned to be built in this project. It will be designed around the core and middle layers, providing systematic support modules such as teaching resource libraries, excellent case libraries, online training courses, and interactive communication communities. This analytical framework not only provides clear guidance for data collection in this study but also establishes a theoretical basis for the functional design and content construction of the resource platform. It also emphasizes that the goal of platform construction is not a one-time skill training, but to provide a sustainable, adaptive, and personalized environment for the long-term career planning of international Chinese language teachers, helping them achieve continuous growth and development throughout their careers.

3. Data Collection and Analysis

3.1 Questionnaire Design

Based on the analytical framework for the usage behavior and needs of digital resources among international Chinese language teachers, this study developed the Questionnaire on the Current Status of Digital Resource Usage by International Chinese Language Teachers, which consists of seven parts. The first part covers teachers' basic information, including gender, age, teaching experience, highest education level, type of institution, age group of students, and teaching format, laying a foundation for analyzing differences in resource usage among teachers with different backgrounds. The second part investigates the frequency of digital resource usage through single-choice and multiple-choice questions, including whether resources are used, daily usage frequency, and main source channels. The third to fourth parts focus on resource usage scenarios and type preferences: the scenario part uses single-choice questions to examine the focus of resource usage in links such as lesson preparation, in-class teaching, after-class tutoring, and performance assessment, as well as in the teaching of language elements and course types; the type preference part uses multiple-choice questions to identify the resource types that teachers frequently use and find most helpful. The fifth to seventh parts concentrate on resource satisfaction, usage effects, and demand expectations: they not only investigate teachers'

satisfaction with the resources of their institutions, the actual effects of resources on teaching and student engagement, and usage problems, but also collect teachers' specific needs for resource types and platform functions, as well as their suggestions for digital teaching training and future resource development through multiple-choice and open-ended questions.

3.2 Survey Participants

To fully understand the current status of digital resource usage among international Chinese language teachers, this study distributed questionnaires and collected data via the "Wenjuanxing" online survey platform from July 1, 2024 to July 1, 2025. In terms of sampling design, to avoid the impact of sample singularity on research conclusions, multiple channels were used to target international Chinese language education scenarios of different types, including domestic colleges and universities, primary and secondary schools, private education and training institutions, as well as overseas Confucius Institutes and Chinese schools. At the same time, emphasis was placed on covering teacher groups with different teaching experience levels, educational backgrounds (bachelor's, master's, doctoral degrees), and student age groups, so as to ensure the structural integrity of survey participants and the representativeness of the sample. A total of 419 questionnaires were collected in this survey; after screening out invalid questionnaires with logical contradictions, excessively short response time, etc., 370 valid questionnaires were finally obtained, with an effective recovery rate of 88.3%. In terms of sample structure, the age range of participants covers all stages from 25 years old and below to over 55 years old; the distribution of teaching experience is even, covering all levels from novice teachers to senior teachers; the educational background is mainly bachelor's and master's degrees; at the same time, the types of institutions and teaching formats show significant diversification characteristics. Details of the specific sample distribution are shown in Table 1.

Table 1. Basic Information of Survey Participants

Basic Information	Category	Frequency	Proportion (%)	Basic Information	Category	Frequency	Proportion (%)
Gender	Female	316	85.41	Highest Education	Bachelor	160	43.24
	Male	54	14.59		Master	205	55.41
	Total	370	100.00		Doctoral	5	1.35
Age	⩽25	215	58.11		**Total**	370	100.00
	26 - 35	143	38.65	Institution Type	Domestic Colleges/Vocational Schools	10	2.70
	36 - 45	9	2.43		Domestic Primary & Secondary Schools	52	14.06
	46 - 55	3	0.81		Overseas Confucius Institutes	127	34.32
	Total	370	100.00		Overseas Colleges/Primary & Secondary Schools	18	4.87
Teaching Experience	< 1	130	35.14		Other Educational Institutions	163	44.05
	1-3	156	42.16		**Total**	370	100.00
	4-6	10	2.70	Teaching Format	Offline	254	68.65
	7-10	52	14.05		Online	63	17.03

	> 10	22	5.95		Mixed	53	14.32
	Total	370	100.00		**Total**	370	100.00
Student Age Group	6-12	92	24.86	Student Age Group	19-45	77	20.81
	13-18	138	37.30		Mixed	63	17.03
Total						370	100.00

3.3 Data Analysis

International Chinese language teachers face multiple problems in the use of digital resources. First, the depth of resource use is insufficient: although 75.68% of teachers use digital resources, the application in after-class tutoring is weak, with most teachers only using them occasionally or barely using them at all; the application in performance assessment is also limited, as most teachers only refer to electronic question banks occasionally, failing to form a complete teaching cycle. Second, there are shortcomings in resource sources and quality: 81.08% of teachers obtain resources from social media, 72.97% of teachers create and organize resources by themselves, the utilization rate of high-quality official resources is low—only 40.54% of teachers obtain resources from official websites—and 75.68% of teachers report that the quality of resources is uneven. Third, resource adaptability is poor: the application rate of digital resources in phonetics teaching, Chinese character teaching, listening courses, speaking courses, and reading-writing courses is much lower than that in vocabulary and grammar teaching and comprehensive courses. Specifically, the application rate is 45.95% for phonetics teaching, 54.05% for Chinese character teaching, 29.73% for listening courses, 13.51% for both speaking courses and reading-writing courses, while it reaches 64.86% for vocabulary and grammar teaching and 89.19% for comprehensive courses. Fourth, there is a lack of platform functions: 56.76% of teachers report that there is no effective resource integration platform, and the needs for accurate resource search functions and resource sharing and communication functions among teachers are not met. Fifth, the training system is incomplete: 72.97% of teachers have not received training related to digital teaching, and there is a significant gap in systematic digital teaching skills training and recommendations for high-quality digital resource libraries.

4. Construction of Competence Improvement Framework and Resource Platform

4.1 Framework for Improving the Digital Intelligence Competence of International Chinese Language Teachers

Combining the four dimensions of the *Standards for Professional Competence of International Chinese Language Teachers* and the TPACK theory, this study constructs a "three-stage and nine-dimension" competence improvement framework. This framework covers the entire growth cycle of teachers, from basic adaptation to high-level innovation, and the competence requirements at each stage correspond clearly to the empowerment direction of digital intelligence technology. The specific content is shown in Table 2.

Table 2. Framework for improving the digital intelligence competence of international Chinese language teachers

Competence Stage	Core Goal	Corresponding Competence Dimensions
Basic Adaptation Stage	Adapt to the basic needs of digital intelligence teaching and realize the initial integration of technology and teaching	1. Digital tool operation competence (basic TK) 2. Standardized resource application competence (CK + resource matching) 3. Basic online teaching management competence (PK + technology adaptation)
Advanced Integration	Deepen the integration of technology and teaching, and improve the ability	1. Resource integration and secondary development competence (TK + CK)

Stage	of resource integration and personalized teaching	2. Data-driven teaching adjustment competence (TK+PK) 3. Cross-cultural digital teaching design competence (cross-cultural communication + technology)
High-level Innovation Stage	Innovate digital intelligence teaching and lead the optimization of teaching models and professional radiation	1. Intelligent teaching program design competence (in-depth TPACK integration) 2. Digital teaching research competence (professional ethics and professional development + technology) 3. High-quality resource and experience radiation competence (professional development + sharing technology)

4.2 Construction of the International Chinese Language Digital Resource Platform

The International Chinese Language Digital Resource Platform takes the "three-stage and nine-dimension" competence improvement framework as its core and is designed around four functional modules: resource supply, competence training, interactive communication, and data feedback. It covers the entire teaching process of teachers and the full cycle of their professional development, and can solve the problems identified in the survey, such as fragmented resources, single platform functions, and large training gaps. The platform adopts an architecture of "1 core entrance + 4 major functional modules + N scenario-based sub-columns", with a simple and easy-to-use interface. The core entrance is equipped with competence assessment and demand matching functions, which can provide personalized guidance for teachers. The four major functional modules not only undertake core functions independently but also coordinate through data interconnection. Among them, the resource library module builds a resource library classified by teaching scenarios, content, and competence stages, and also establishes review and evaluation mechanisms to ensure resource quality; the competence training module sets up online courses, practical training camps, and one-on-one tutoring in accordance with the "three-stage and nine-dimension" framework to fill the gap in digital teaching training; the interactive communication module sets up teacher communities, theme topics, and Q&A sections to solve the problem of lack of experience sharing channels; the data feedback module embeds statistics and analysis functions to provide teachers with teaching data and competence development feedback, helping teachers grasp their growth trajectory.

In addition, the platform has three key features and innovations. First, scenario-based adaptation: all functions and resources are designed around teachers' real teaching scenarios to avoid technology for technology's sake. For example, it provides "low-bandwidth adaptive resources" (such as compressed audio and offline courseware) for teachers in overseas Confucius Institutes to solve network instability issues. Second, a collaborative ecosystem: it links universities, overseas Chinese education institutions and senior teachers. Universities provide theoretical support and expert resources, institutions offer frontline teaching cases, and teachers are both resource users and creators, forming a multi-party co-construction and win-win ecosystem. Third, sustainable operation: it establishes a resource upload incentive mechanism—after review, teachers who upload high-quality resources can obtain platform points (redeemable for training courses or consulting services). Meanwhile, it regularly launches resource update plans, updating resources and functions in line with changes in international Chinese education policies (such as the International Chinese Language Education Standards for Chinese Language Proficiency) and new teaching needs to ensure the platform serves teachers' development in the long term. After completion, the platform will first be piloted among teachers and students of TCSOL (Teaching Chinese to Speakers of Other Languages) majors in several universities and teachers of cooperative overseas Confucius Institutes. It will optimize functions and resources based on user feedback, then gradually promote to universities nationwide and overseas Chinese education institutions, becoming a core support platform for the digital and intelligent development of international Chinese language teachers.

5. Conclusion

This study focuses on digital intelligence empowering international Chinese language teachers, constructing a competence improvement framework and a digital resource platform via literature review, theoretical analysis and empirical research, to support teachers' professional growth. Surveys show international Chinese education has shortcomings in resource integration and technology application, with teachers facing fragmented resources and single-function platforms. The proposed "framework + platform" solution, supported by educational informatization and AI, breaks traditional training limits and builds a career-cycle digital ecosystem. Theoretically, it enriches teacher development and educational digitalization research, supporting the *Standards for Professional Competence of International Chinese Language Teachers*. Practically, it provides operable plans for institutions to improve teaching efficiency. Strategically, it aligns with "Educational Power" and "Digital China", boosting Chinese language's global influence. Despite limitations in sample size and platform prototype (to be addressed via future research), this study offers a systematic solution for teachers' digital growth. With optimization, it is expected to drive high-quality international Chinese education and support Chinese language dissemination and global educational cooperation.

Fund Project

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