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Research on the Digital Transformation Path of Teaching Staff for International Students in China

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***A*bstract:** Teachers play a pivotal role as key executors and direct stakeholders in the education and teaching of international students in China. Their successful navigation through the digital transformation journey is crucial in determining the seamless digital transformation of education and teaching for international students in China. Based on an in-depth examination of cognitive, technological, and institutional challenges faced by teachers involved in teaching international students in China during their digital transformation, this paper explores pathways to facilitate the digital transformation of the teaching staff for international students in China and puts forth pertinent policy suggestions.

Keywords: Education for international students in China; Digital transformation for teachers; Digital Competency; Cross-cultural teaching

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1. Introduction

In recent times, the digital transformation of education globally has emerged as a prevalent trend in educational development. Notably, the report of the 20th National Congress of the Communist Party of China explicitly advocates for vigorously advancing education digitization and initiating the National Education Digitization Strategy [1]. As a vital component in fostering the internationalization of Chinese education, the education for international students in China must expedite its adaptation to the wave of comprehensive digital transformation in education. Serving as the implementers of education for international students in China, the ability of the teaching staff to undergo digital transformation will directly influence the teaching quality and learning experience of international students. In comparison to domestic student education, the education for international students in China is characterized by cross-cultural and linguistic diversity [2], thereby

imposing heightened demands on the teaching staff catering to international students. Currently, the digital transformation of teaching staff for international students in China encounters numerous hurdles in terms of cognition, technology, and organizational support, which directly impede the progress of digital transformation in education for international students in China. In this context, identifying effective pathways for the digital transformation of the teaching staff for international students in China is of paramount importance to the digital transformation of education for international students in China. Building upon an analysis of the current status and challenges, this paper outlines a transformation pathway and offers targeted policy suggestions.

2. Literature review

2.1. Research on the connotation of digital transformation of the teaching staff

The digital transformation of the teaching staff is a part of the digital transformation of education; therefore, the digital transformation of the teaching staff comes from research on digital transformation and educational digital transformation. In terms of understanding digital transformation, Marzenna et al. believe that digital transformation is the use of digital technologies, tools, resources, and other digital strategies to transform or change existing social processes or patterns of human activity [3]. Karimi et al. and Xiao et al. believe that digital transformation will change the social ecosystem, which will impact individuals, organizations, and industries [4–6]. In terms of research on the digital transformation of education, some scholars also understand it from an ecosystem perspective. For example, Professor Yang believes that the digital transformation of education is a continuous process of gradually forming a high-quality education system that is highly compatible with the development of the modern economy and society [7]. Professor Zhu believes that the digital transformation of education is a process of forming a good educational ecosystem through comprehensive innovation and change [8]. From the perspectives of governance and ecology, Zheng believes that the digital transformation of the teaching staff can be achieved through multi-party participation and the support of digital technology, to build a digitally excellent teaching team [9].

2.2. Research on the special characteristics of education for international students in China

Tan researched cross-cultural education for international students studying in China [2]. Li discussed the connotation of education for international students studying in China, including targeting the educated population, and elaborated on its uniqueness compared to general higher education in China [10].

In summary, there is currently no research specifically focused on the digital transformation of the teaching staff of international students in China, but the existing studies have provided us with direction and ideas for studying the digital transformation of the teaching staff of international students in China.

3. The predicament of digital transformation for teachers in the education for international students in China

3.1. The cognitive dilemma of teachers as the primary agents: Underlying constraints in the digital transformation of education for international students in China [11]

(1) There exist significant deficiencies and biases in cognition: Specifically manifested in two ways: (I) an excessive reliance on traditional pathways; Technology-resistant teachers perceive digitization merely as teaching through a large screen or PPT, continuing to employ outdated methods to address new challenges. (II) A cognitive bias towards technology. Some teachers harbor doubts about the efficacy of

AI in advancing teaching reforms, with some even going so far as to believe that AI is ineffective and potentially poses significant negative impacts and hidden dangers to education and teaching.

(2) In terms of ability anxiety, group differences are evident. One is the low self-efficacy of teachers. Some teachers exhibit a lack of confidence in their ability to self-learn new technologies, particularly those aged 50 and above who perceive learning such technologies as "exceeding their capabilities" and tend to shy away from applying these new technologies. The second is that it has the characteristic of hierarchical differences. A notable hierarchical disparity exists between ordinary teachers and management in terms of their awareness and utilization of new technologies.

(3) Difficulties arising from cross-cultural cognition. The education of international students in China possesses unique characteristics, which directly contribute to specific cognitive dilemmas for these students. These dilemmas manifest in two aspects: firstly, the shift in power relations due to changes in teaching philosophy. The digital transformation of education aims to return the initiative of learning to learners [12], transitioning from a "teacher-centered" to a "learner-centered" approach. This transformation has had a profound impact on teaching, exacerbating discomfort and hindering the digital transformation of education for international students in China. Secondly, there exists an opposition between Eastern and Western learning paradigms. The Eastern imparting education and Western constructivist learning theory themselves face significant conflicts, making it even more difficult to reconcile in a digital teaching environment.

3.2. Technical dilemma: The interactive impact of dual barriers of capability and culture

(1) The digital competency of teachers faces structural issues: the current pool of teaching staff for international students in China exhibits a structural imbalance in their digital competency. Specifically, there are three problems: Firstly, a disconnection in technology integration capabilities. Most teachers from non-computer backgrounds have yet to develop a comprehensive theoretical framework for integrating technology, teaching, and subject-specific content knowledge, hindering their ability to effectively incorporate technology into curriculum design. Technology is primarily used as a procedural tool in teaching, often limited to presentation aids such as PPT slides. Secondly, there is a lack of breakthrough in transforming technological application paradigms. Few teachers leverage big data for learning situation analysis, and even fewer employ AI technology for personalized instruction. Thirdly, awareness of data security and ethics is scant. Only a handful of teachers consider data privacy protection, security concerns, and the ethical implications posed by artificial intelligence in digital teaching processes. These potential hidden risks could exert significant impacts on personal safety, cultural conflicts, and various other aspects within the broader context of international education.

(2) Significant challenges exist in adapting technology across cultural divides. International students studying in China encounter substantial cultural barriers when it comes to the application of technology in Chinese classrooms, facing a dual barrier of technology and culture, with the language-technology gap being particularly acute. Research data indicates that most mainstream educational technology platforms have yet to offer learning technologies in non-universal languages, and consequently, most international students are unable to utilize these technologies for their learning activities. Due to variations in the level of technology acceptance among international students stemming from diverse cultural backgrounds, it proves nearly impossible to devise a universally applicable and visually engaging teaching technology solution that can gain simultaneous acceptance across all cultural

contexts.

3.3. Institutional dilemma: Inadequate organizational support system

(1) Lack of systematic support: The school's digital transformation support system for international student teachers faces several challenges: firstly, an absence of a tailored training program. Current digital training within the school fails to cater to the individual development needs of different teachers and overlooks cross-cultural factors, leading many participating teachers to deem the training ineffective. Secondly, unequal funding allocation. Educational funds are unevenly distributed among schools, with higher investments in advanced digital education at some schools compared to others. This disparity is even more pronounced in the digital education of international students than in that of domestic students.

(2) Institutional inertia is evident in thinking patterns: Firstly, there exists a considerable mismatch between the multi-layered institutional barriers and hierarchical management frameworks shaped by historical path dependence, and the practical needs for technological applications. For instance, the development of virtual courses in some universities necessitates the application for recorded classrooms, a process that entails filling out numerous intricate and multi-layered forms and documents. Secondly, an adequate evaluation system is absent. Most institutions lack recognition for digital teaching accomplishments within their evaluation frameworks, and even fewer have established corresponding evaluation criteria for digital teaching tailored for international students, coupled with a lack of institutional incentives. Thirdly, there is a notable lack of a robust organizational digital culture. Many university administrators tend towards "digital risk aversion," adopting a relatively cautious approach towards the adoption of educational technology. Consequently, it is challenging to foster an organizational digital culture within these institutions, where a certain degree of resistance to innovation persists.

4. Construction of the digital transformation path for teachers of international students in China

Based on the aforementioned challenges in the digital transformation of teachers for international students in China, this paper proposes a three-dimensional development pathway encompassing "Technology Empowerment, Teaching Innovation, and Cultural Adaptation."

4.1. Technology empowerment: Establishing a differentiated system for enhancing digital competencies

Addressing the cognitive and technological barriers faced by teachers of international students in their digital transformation, and acknowledging the unique characteristics of this student population as well as the greater ease of adoption of new technologies by younger teachers, we categorize teachers at different levels solely based on their proficiency with technology, transcending the constraints of teaching experience. This approach facilitates the establishment of a tiered system for enhancing digital competencies among teachers of international students in China, facilitating the integration of emerging technologies.

For Novice Teachers: In terms of software and hardware tool application, hardware proficiency encompasses the ability to operate and utilize commonly used digital office equipment such as computers, printers, scanners, and projectors. Software proficiency includes the application of commonly used tools

such as WORD, EXCEL, ClassIn, and Tencent Meeting. In terms of digital resource development, novice teachers should be capable of creating courseware that aligns with international standards. In the digital literacy dimension, they should possess basic skills in data acquisition, processing, and analysis using EXCEL, be aware of the types of sensitive data, and exhibit a certain level of security awareness. In terms of teaching methodologies, they should understand the real-time interactive mode of online live streaming and the asynchronous learning mode facilitated by discussion forums.

For Skilled Teachers: From the perspective of intelligent assessment, they possess proficiency in the calibration and optimization of AI grading systems, adept at conducting evaluations across various intelligent assessment dimensions. In terms of data literacy, they are capable of leveraging big data to analyze and diagnose learning situations, utilizing sophisticated statistical software like SPSS to analyze student learning behaviors. They exhibit a strong sense of data security and the ability to manage straightforward data security incidents. Furthermore, they can seamlessly integrate teaching resources such as courseware across platforms according to their needs, ensuring smooth connections between different interfaces. In terms of teaching methodologies, they are proficient in both online live streaming with real-time interaction and asynchronous learning methods based on discussion forums, while also being familiar with the organizational aspects of blended learning.

For Backbone Teachers: In the realm of virtual simulation, they possess the capability to independently develop virtual cross-cultural teaching scenarios. They are adept at constructing personalized recommendation algorithm models tailored to learning dimensions. When it comes to data literacy, marked by a robust awareness of data security, they can utilize existing data to make informed judgments and issue warnings regarding complex data security issues. As for teaching methodologies, they adopt online teaching methods, incorporating real-time interactive live streaming sessions and asynchronous learning through discussion forums.

4.2. Teaching innovation: Create a blended learning model that combines online and offline learning

An online cultural adaptation-oriented preview is employed, utilizing multilingual micro-courses accompanied by pre-tests to gauge the learning situation and offer guidance for diverse differentiated teaching modes, both online and offline. Cultural disparities are bridged, and understanding of diverse cultures is fostered through offline case-based discussions and cross-cultural student collaboration in group settings. Subsequently, various multimodal languages are leveraged online for feedback. Building upon video or voice assessments, students can obtain enhanced feedback through teacher-student co-evaluation, thereby refining and enhancing their reading abilities.

4.3. Cultural adaptation: Establishing a three-dimensional adaptation framework

To enhance “cognition,” cross-cultural sensitivity training is conducted for teachers, establishing a “cultural background knowledge repository” that is user-friendly for educators. In terms of “behavior” construction, with the foundation of the “cultural background knowledge repository,” functionalities such as search and grouping can be facilitated. Regarding “platform” development, the platform’s linguistic foundation should rest upon “intelligent language tools,” fostering a multilingual intelligent teaching system. The design of the platform’s UI interface must also accommodate “cultural” factors, ensuring compatibility with diverse cultures.

5. Policy recommendations for the digital transformation of teachers of international students in China

Addressing cognitive, technological, and institutional challenges, and drawing from a comprehensive review of

education policies for international students and China's digital development trends, we present several policy suggestions aimed at advancing the digital transformation of teachers of international students in China.

5.1. Formulate differentiated training programs

Provide various types of teachers with tailored training content of different levels. For instance, novice teachers can be primarily trained in the use of basic information tools required for digital classroom management through online teaching tools. Skilled teachers can enhance their personalized teaching abilities through training and intelligent assessments, among other methods. For backbone teachers, training can focus on new technologies such as AI-assisted teaching and virtual simulation experiments. Additionally, organize different types of teachers into mutual aid groups to facilitate learning and exchange, fully leveraging the strengths of each level to promote teaching innovation. Select teachers with strong technical abilities to serve as digital teaching mentors through the "mentoring" approach, encouraging other teachers to make progress together. Furthermore, to promote research on digital teaching among teachers and enhance their digital teaching research capabilities, a digital training platform will be established to conduct digital literacy training and online and offline digital teaching competitions for teachers.

5.2. Enhance the cross-cultural digital teaching support system

Establish a multilingual and multimodal teaching resource repository accessible to international students from diverse cultural backgrounds. Foster collaboration between domestic and overseas universities, encouraging teachers in domestic institutions to prioritize addressing students' varied cultural needs, emphasize the reform of classroom instruction, actively facilitate the sharing of teaching resources for international students, and develop a dedicated online course platform tailored for them. Strengthen cooperation and exchanges with foreign universities through initiatives such as teacher and student exchanges for study abroad and online teaching activities. Additionally, it is advisable to collaborate with foreign universities to create resource teaching platforms tailored for localized operations. Enhance the technical support role of foreign languages by incorporating AI translation tools into classroom instruction, thereby expanding language coverage and minimizing language barriers for both teachers and students.

5.3. Establish and improve the system of institutional incentives and organizational guarantees

Reform the teacher evaluation system by incorporating the assessment of digital teaching achievements into the professional title evaluation and appointment framework, with an appropriate increase in its weight. When necessary, a dedicated evaluation pathway can be established to guide and motivate teachers to leverage new technologies for teaching innovations. A special fund for digital teaching reform initiatives should be established, providing greater financial support and incentives for exemplary cases of digital teaching transformation. Policies supporting institutions should be refined. Efforts should be made to continuously deepen, revise, and enhance policies and measures related to digital empowerment across institutions, personnel, equipment, and funding. The coherence and integration of these policies should be strengthened. Diverse digital cultural promotions should be organized to foster an ideological awareness among units and business lines about interdepartmental collaboration and data sharing. Emphasis should be placed on publicizing digital empowerment initiatives, intensifying the dissemination of digital cultural products, and vigorously promoting digital cultural achievements. To bridge the digital divide between school administrators and teachers, a digital

advisory committee has been set up on campus to facilitate regular, multipartite dialogues. At the research level, communication channels between school administrators and teachers have been established to promptly address and resolve pertinent issues, ensuring that decisions made are grounded in reality.

6. Conclusions

The digital transformation of the teaching staff for international students in China constitutes a complex, systematic endeavor, necessitating a holistic consideration of multiple facets, including cognition, technology, and institutional frameworks. This paper delves into the prevalent challenges in the digital transformation of this teaching staff and puts forth a multitude of pathways and recommendations, such as tiered training, cross-cultural alignment, and policy incentives, which have addressed the existing difficulties to some extent. Moving forward, we will further intensify our research on the digital transformation path of the teaching staff for international students in China against the backdrop of the integration of artificial intelligence technology and education.

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Disclosure statement

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