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Research on the Strategies for Empowering Education Reform and Innovation of International Students in China with Digital Education

Jiajing Zou[1]*, Yunxia Xue[2]

[1]Publicity Department of the Party Committee, Jiangsu University of Science and Technology, Zhenjiang 212100, Jiangsu, China

[2]Information Construction and Management Office, Jiangsu University of Science and Technology, Zhenjiang 212100, Jiangsu, China

**Corresponding author: Jiajing Zou, zou0701@just.edu.cn*

Abstract: In the context of the rapid development of information technology, digital teaching has emerged as a crucial element in driving educational innovation for international students in China. This paper examines the challenges faced during the digital transformation of education for international students in China. It puts forward strategies and suggestions for digital education to support the educational reform and innovation of international students in China from three perspectives: the in-depth integration of digital technology into the entire process of international student education, the digital literacy of teachers, and the cross-cultural communication skills of international students.

Keywords: Digital education; Digital technology; Education for international students in China; Reform and innovation

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1. Introduction

In recent years, digital technology has witnessed rapid development and is swiftly integrating into diverse aspects and crucial links of the economic and social spheres, exerting revolutionary influences on production modes, lifestyles, educational approaches, and social governance systems. In the educational domain, with the progressive integration and innovative implementation of digital technology with the core elements, teaching processes, and evaluation systems of education, digital education, as an emerging educational form, is gradually evolving and expanding. From the perspective of national strategy, digital education is not only a key constituent of the Digital China construction system but also plays a significant role in facilitating the implementation of the strategy for building an educational powerhouse. Minister of Education Huai Jinpeng once emphasized that the development of digital education and the promotion of digital transformation represent the trend, the requirement for development, and the direction of reform[1].

With the continuous deepening of the education system reform and the expansion of opening-up in China, the implementation of education for international students has emerged as a significant strategic initiative to enhance the

internationalization of higher education. Digital education has evolved into a crucial driving force and a fundamental project for promoting educational reform among international students in China. Since the onset of the COVID-19 pandemic in 2020, the mobility of international students has been notably affected. As online-offline blended learning has become the primary mode of education for international students, the rapid promotion of online education in emergency circumstances has also presented numerous challenges, which have exerted a certain influence on the quality of training for international students in China[2]. In the post-pandemic era, online teaching for international students in China supported by digital technology will persist, offering unprecedented opportunities and challenges for promoting educational reform and innovation. Integrating digital technologies such as big data, the Internet of Things, artificial intelligence, and 5G into the education and teaching of international students in China, and exploring how digital technologies can drive innovation and transformation in international student education, are of great significance for improving the quality of international student training and advancing the internationalization process of education in China.

2. Domestic and Foreign Relevant Policies

Numerous countries and prominent international organizations are exerting significant efforts to advance the digital transformation of education systems. In 2016, Hungary initiated the Digital Education Strategy. In February 2020, Mexico issued the "2020 Digital Learning Plan". In September 2020, the European Commission published the "Action Plan for Digital Education (2021-2027)". In July 2023, the Organization for Economic Cooperation and Development (OECD) released a report entitled "Shaping Digital Education: Key Factors for Improving Quality, Equity, and Efficiency"[3].

China places significant emphasis on advancing digital transformation within the educational domain. Commencing from 2019, a succession of policy documents have been issued, including "China's Education Modernization 2035", "Implementation Plan for Accelerating the Promotion of Education Modernization (2018-2022)", and "Opinions on Accelerating and Expanding the Opening-up of Education in the New Era"[4]. In 2022, the Ministry of Education officially initiated the Education Digitalization Strategy Action and launched the National Higher Education Smart Education Platform. In December of the same year, the educational industry standard of "Teacher Digital Literacy" was promulgated to comprehensively facilitate the in - depth development of digital transformation in education.

3. The dilemma of digital transformation in education for international students studying in China

At the institutional level, certain universities face deficiencies in digital teaching resources, including digital textbooks, question banks, case libraries, and material repositories. This scarcity poses challenges in delivering guidance and support services for international students' digital learning endeavors, thereby failing to cater to their diverse and individualized learning requirements. There is an urgent necessity for the establishment of digital education infrastructure and environments, such as smart classrooms, virtual laboratories, and innovation practice centers. Moreover, the functionalities of digital teaching platforms demand continuous optimization. During students' online learning experiences, instances of network instability or system latency may occur, and they may not receive timely and effective technical assistance. Additionally, the learning feedback and evaluation system for international students in digital teaching remains inadequate, and personalized learning support is relatively limited. Consequently, it is arduous to comprehensively address their diverse needs for resource acquisition, progress management, and academic guidance throughout the learning process.

From the perspective of teachers, certain educators adhere to traditional teaching methodologies and exhibit a dearth of diversity in their instructional approaches, thereby establishing a relatively fixed cognitive framework and experiential system for teaching. This phenomenon may give rise to cognitive anchoring bias regarding the actual efficacy of digital technology in teaching reform. Simultaneously, some teachers encounter difficulties in leveraging digital technology for

teaching owing to insufficient training and practical experience, which results in heightened resistance. They even harbor concerns that digital technology may exert substantial negative impacts and pose potential risks to educational endeavors.

In terms of the level of international students, the cohort of international students demonstrates varying degrees of adaptability to digital education, attributable to their diverse cultural backgrounds and linguistic disparities. International students hailing from certain underdeveloped regions confront operational challenges and technical impediments during online learning, primarily due to a deficiency in fundamental digital skills. This situation renders it arduous for them to engage in autonomous learning via online resources. Owing to cultural discrepancies and language barriers, some international students encounter difficulties in participating in group discussions within virtual classrooms. Consequently, their communication with classmates is restricted, leading to an isolated learning experience. Moreover, due to time-zone variations, some international students undertaking remote studies are unable to participate in live courses in real-time, which also exerts an impact on their learning efficacy and interactive experience.

4. Strategies for Empowering Education Reform and Innovation for International Students in China through Digital Education

4.1. Integrating digital technology into the entire process of international student education

The adoption of 5G technology offers comprehensive support for online education. 5G is recognized as an emerging technology featuring high-speed transmission, low latency, and large-scale connectivity. As a relatively advanced network technology in the realm of human-computer interaction, it can offer crucial technical support for the remote online education of international students. It enhances network stability and expedites their access to learning resources, thereby improving their learning efficiency and outcomes[2].

Leveraging the integration of artificial intelligence and knowledge graphs to strengthen the interaction and communication between teachers and students. In the process of online teaching, a course knowledge graph should be designed in advance to establish a structured knowledge base. Moreover, an intelligent question - answering system should be developed through artificial intelligence technology to offer students instant assistance. This implicitly enhances the latent interaction between teachers and students and objectively contributes to the improvement of the effectiveness of two - way communication in teaching.

Employ advanced big - data and artificial intelligence (AI) technologies to gather data information throughout the teaching process. Teachers are required to process a substantial volume of unstructured data, encompassing teaching plans, classroom activity records, students' learning statuses, evaluation results, and other relevant information. Through the utilization of artificial intelligence and big - data technology to automatically organize data catalogs and conduct regular data collection, not only can the data management efficiency of the entire teaching process be effectively enhanced, but it can also offer fundamental support for teaching evaluation and design.

Through the application of big data technology to analyze teaching evaluation information, it becomes feasible to discern the strengths and weaknesses of teachers' instructional practices. This enables the facilitation of peer learning, the reinforcement of strengths, and the mitigation of weaknesses, thereby offering references for the improvement of teaching plans. By leveraging artificial intelligence and big data technology, it is possible to collect and analyze data across the entire teaching process, conduct in - depth investigations into diverse information, pinpoint deficiencies in students' learning, formulate targeted teaching plans, and optimize teaching design frameworks.

In the cultivation plan for science and engineering students, experimental and practical courses assume a pivotal role. Virtual reality technology amalgamates computer science, electronic information, and simulation technology, generating a simulated environment via computers to offer users a realistic sensory experience. By leveraging virtual reality technology, immersive virtual experimental environments, encompassing virtual enterprises, scenarios, laboratories, and production processes, are designed to establish appropriate learning conditions for international students' online experimental and practical courses.

Integrate big data and the Internet of Things to enhance the overall comprehensiveness of the teaching evaluation system. The cameras installed in the multimedia classroom are capable of collecting abundant facial expression data of students. Leveraging artificial intelligence and big data technology, the entire teaching process can be comprehensively collected and analyzed. By gathering students' facial expressions, textbook resources, teaching activity data, and in-class student feedback information, a teaching analysis and evaluation center will be developed through the application of IoT and big data technology. Construct a teaching data analysis platform to optimize the evaluation system, integrating multi-dimensional evaluation and online feedback mechanisms. Ultimately, an online teaching analysis and learning monitoring system based on big data will be established.

4.2. Enhance teachers' digital literacy

Teachers assume a pivotal role in the education of international students, directly affecting the execution of teaching. To effectively elevate their quality, it is imperative to enhance their capabilities in five dimensions: digital awareness, digital technology knowledge and skills, digital application proficiency, comprehension of digital social responsibility, and professional development competence[5]. Educators must have a profound understanding of the substantial influence of digital technology on economic, social, and educational advancement, and elucidate the opportunities and challenges it presents to the educational domain.

Moreover, teachers must possess fundamental digital technology skills and be proficient in utilizing diverse educational software and systems to better integrate online and traditional teaching approaches. In their career development, teachers should actively keep pace with the trend of educational digital transformation, actively engage in various digital teaching training and research activities, explore methods for the in-depth integration of information technology and subject teaching, and offer robust support for improving teaching quality and efficiency.

Educators should focus on how to effectively integrate digital technology with curriculum teaching, actively explore intelligent teaching strategies, and utilize technology to innovate the classroom environment. In teaching activities, teachers should flexibly adopt technologies such as virtual simulation and artificial intelligence to create novel teaching methods, enhance classroom interaction and practical outcomes. Additionally, teachers should actively employ data analysis tools to study students' learning behaviors, implement personalized teaching, refine teaching strategies, and augment teaching effectiveness.

4.3. Enhance the cross-cultural learning ability of international students

Enhancing the cross-cultural communication capabilities of international students stands as one of the core objectives of contemporary international education. At the institutional level, a dynamic tracking mechanism can be established to oversee the learning endeavors and cultural acclimatization of international students. Through the timely collection and analysis of relevant data, personalized support schemes and targeted intervention strategies can be formulated for international students, enabling them to better broaden their international outlook and augment their cross-cultural proficiency.

Moreover, educational institutions ought to construct diverse cross-cultural communication platforms, with a particular emphasis on the planning of online international exchange activities. This can assist international students in gradually enhancing their cultural adaptability and refining their cross-cultural communication skills within virtual learning settings. International students are required to exhibit a proactive learning attitude. Firstly, they should actively engage in specialized training in digital skills, which can enhance their adaptability to online learning and strengthen their cross-cultural communication capabilities. Additionally, by leveraging virtual reality technology, students can immerse themselves in the social life scenarios of various countries. This immersive approach can facilitate international students in more directly experiencing the characteristics of multiculturalism, thereby deepening their comprehension and tolerance of diverse cultures.

5. Conclusion

International student education is a key component of higher education. Applying digital technology to various aspects of international student education, including educational content, teaching processes, and evaluation mechanisms, is an effective way to enhance educational resources. This not only helps to improve the quality of education for international students, but also promotes the internationalization of higher education, which has an important impact on building an education powerhouse.

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Disclosure statement

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