Innovative Action Research on the Digital Development of Education in China: A Case Study of Smart Education Demonstration Zone

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Abstract: Countries around the world are trying to deeply integrate digital and education to empower the digital transformation of education, and China has laid out a variety of education digital transformation strategies, and the region-oriented smart education demonstration zone is one of them.

Keywords: Digital Education; Smart Education Demonstration Zone; Value Implications

1. Background of the rise of digital education

The United Nations, countries around the world, and many international organizations are taking active actions to take digital education as an important way and measure to cope with the challenges of the crisis and open up a bright future.Digital transformation has become an important carrier and direction of education transformation around the world. The United Nations Transforming Education Summit identified digital transformation in education as one of five priority areas for action, and emphasized that the digital revolution should benefit all learners. Many countries have introduced digital development strategies, and education is an important part of them. China will further implement the national education digitalization strategy, enrich the supply of digital education resources, build a broad and open learning environment, accelerate the sharing of resources between different types and levels of learning platforms, promote the integration of new technologies and education learning, and accelerate the digital transformation of education.

2. Overview of the Smart Education Demonstration Zone

"Smart Education Demonstration Zone" refers to the support of the local government since 2019, the education administrative department coordinates relevant institutions, gives full play to the role of the market mechanism, uses a new generation of information technology, provides personalized support and precise services for students, teachers and parents, collects and uses the state data of the participant group and the education and teaching process data, and promotes learners to learn at any time, anywhere, in any way, and at any pace, so as to provide teachers and students in the region with a high learning experience. The supply of education with high content adaptation and high teaching efficiency to promote educational equity and improve the quality of education. The Ministry of Education has carried out the construction and practical exploration of the "Smart Education Demonstration Zone" in order to promote the digital transformation, intelligent upgrading and integrated innovation of regional education, realize the reform and innovation of educational concepts and models, teaching content and methods, improve the level of regional education, explore and accumulate advanced experience and excellent cases that can be promoted, and form new ways and models to support and lead the modernization of education.

3. Feasibility analysis of the smart education demonstration zone

There are several major points in the construction of the smart education demonstration zone, mainly including:

Promote the reform and innovation of talent training mode. Carry out the exploration of a new teaching mode centered on learners, help students improve their interest in learning, improve their initiative in learning, improve their learning efficiency, and cultivate more innovative talents with innovative thinking and ability and political integrity from "0 to 1".

Highlight the innovative application of artificial intelligence. Take the school as the unit, explore the school-based practical curriculum of artificial intelligence, and build a school-based curriculum system of artificial intelligence education: with intelligent terminals as the carrier, explore the combination of science, technology, engineering, arts, mathematics (hereinafter referred to as STEAM) and artificial

intelligence, that is, a new teaching mode of "STEAM + artificial intelligence education": In the form of an online training community, we will explore a precise teaching and research model based on big data assessment to promote the high-quality and balanced development of education.

4. the value implication of the smart education demonstration zone

4.1. Strive to improve the digital capabilities of teachers and students, and promote the innovation and application of intelligent technology

The intelligent era has put forward higher requirements for talent training goals and specifications, emphasizing the improvement of digital literacy in curriculum and practical teaching. The demonstration area fully implements the curriculum standards of information technology and information technology, and improves students' core literacy such as information awareness, computational thinking, digital learning and innovation, and information social responsibility. Create excellent online courses, apply information technology innovation to solve teaching pain points and difficulties, and improve teachers' information teaching capabilities. Widely carry out comprehensive practical courses in information technology, set up artificial intelligence education courses and experimental projects, and effectively improve students' information technology application and innovation ability. Carry out various forms of innovation education such as maker education and STEAM education to cultivate learners' interdisciplinary problem-solving ability and innovation ability.

Dongcheng District, Beijing has established a district-level "1+N+8+X" youth "college system" curriculum system and practice base, and established the Dongcheng District Youth Information Literacy Education College to cultivate students' innovative awareness, innovative thinking and innovation ability, build a platform for the display of students' innovative works, and lead young people to explore the field of artificial intelligence technology; Through measures such as the intelligent training system for teachers and the evaluation and reward mechanism, we will improve teachers' professional skills and information literacy, and promote teachers to actively adapt to new technological changes such as informatization and artificial intelligence.

4.2. Deeply promote the reform of classroom teaching and build a new teaching model

The cultivation of innovative talents needs to rely on school education, and promoting the "classroom revolution" is one of the key issues in the process of creating the demonstration area. The classroom is the main battlefield of education reform, and only by building a new teaching model that conforms to the cognitive characteristics of "digital natives" can we promote learners' active learning, unleash their potential, and develop in an all-round way. Information-based teaching helps to realize the organic combination of large-scale education and personalized training. The demonstration area deepens the innovative integration of information technology and classroom teaching, advocates teachers' innovative application of information technology to improve teaching based on evaluation, strengthens student-oriented teaching practice, and promotes the realization of classroom teaching reform. Encourage the application of new teaching methods such as collaborative constructive learning, ability-guided learning, and design-based learning, and promote the comprehensive improvement of students' comprehensive quality and ability such as cooperation, practice, and innovation ability: excavate typical cases of applying information technology to solve teaching "pain points", and give play to the leading and exemplary role of excellent teachers.

4.3. Data-driven educational evaluation reform to support the comprehensive quality evaluation of students

In the era of intelligence, the application of new technologies has changed the single, score-based evaluation criteria in traditional teaching, emphasizing the multi-dimensional evaluation of students' comprehensive quality. The demonstration area innovates evaluation tools, deepens the application of education big data, analyzes the learning process, improves the matching degree between the supply of teaching services and the demand for learning, optimizes the quality and efficiency of teaching services, and realizes the effective and high-quality supply of education services. Actively participate in the pilot work of information technology to support the comprehensive quality evaluation of students, and use data-driven solutions for the evaluation of students' comprehensive quality to explore and carry out the longitudinal evaluation of the whole process of students' learning and growth at all grades, and the horizontal evaluation of all elements

of morality, intelligence, physical fitness, art and labor.

4.4. Consolidate the intelligent integration of the learning environment, and break down the barriers of home-school-community collaborative education

Teacher-student behavior and its interaction are the main factors affecting the effectiveness of education and teaching, and the smart learning environment can shape the behavior habits of teachers and students. With the development of artificial intelligence, the Internet of Things and other technologies, the learning environment has changed from a closed physical space to an open, virtual and real space. Driven by data intelligence, the demonstration area incorporates smart education into the construction of smart cities, smart villages and smart societies, breaks the data and information barriers between schools, families and society, and promotes the all-round mining and integration of education data. Formulate rules and systems for the confirmation, openness, docking, and protection of educational big data, and promote data integration between all levels and types of digital platforms: Use learning analysis, education data mining and other means to improve the matching degree between the supply of teaching services and the demand for learning, achieve accurate push, and optimize the quality and efficiency of teaching services.

4.5. Promote the application of smart education platforms and optimize regional public service capabilities

The key to the development of regional smart education lies in the establishment of a collaborative innovation mechanism with the participation of the government, scientific research institutions, enterprises and other parties, and the reform of the organized education system. Relying on the public service system of digital educational resources, especially the national smart education platform, the demonstration zone brings together the forces of schools, scientific research institutions and enterprises to vigorously promote the digital construction of educational resources, explore new mechanisms for resource sharing and service supply, use intelligent technology to gather high-quality education and teaching resources, expand the coverage of high-quality educational resources, effectively support schools, teachers and students to carry out information-based teaching and learning applications, and comprehensively improve the digital public service capacity of regional education.

4.6. Intelligent technology empowers education governance and promotes the transformation of educational organizational forms

Forming a new pattern of education governance with the participation of the whole society and promoting the modernization of the education governance system and governance capacity have become the key to comprehensively deepening education reform. Intelligent technology empowers education governance, which will promote the reform and innovation of educational organization and management mode, and promote the scientific decision-making of education and the precision of resource allocation. The demonstration zone establishes and improves the scientific decision-making and education governance mechanism assisted by big data, makes reasonable use of the national education basic database and urban development data, effectively supports various decision-making in education, and improves the level of digital governance and service capacity of education; Carry out research on dynamic simulation of education, use machine learning, fuzzy mathematics and other methods to establish models, dynamically simulate the results of educational decision-making, and provide scientific basis for educational decision-making. Make full use of intelligent technology to perceive, predict and warn the campus infrastructure and safe operation, timely grasp the cognitive and physical and mental changes of teachers and students, and make active, timely and accurate decisions. During the epidemic period, each demonstration area gave full play to the advantages of the regional informatization public service support system, made overall planning, and deployed the relevant teaching activities of "suspending classes without suspending learning", and walked in the forefront of this unprecedented educational informatization social experiment. At the same time, the experimental project of education social governance under the condition of artificial intelligence in relevant regions has also achieved positive results in the construction of smart education environment, promoting the combination of large-scale education and personalized training.

Wuhou District of Chengdu City uses the preliminarily built Wuhou Education Data Center to integrate the data of four application

platforms, including the national student registration system, the comprehensive quality evaluation data of Chengdu students, the data portrait of teachers in Wuhou District, and the myopia prevention and control of primary and secondary schools and kindergartens in Wuhou District, and initially realizes multiple application scenarios such as "development monitoring, remote supervision, teaching analysis, equipment management, myopia prevention and control, supervision and evaluation, and career statistics".

Conclusion:

As one of the strategies of China's digital education, the smart education demonstration zone has many advantages: first, to build a public platform for China Unicom to create an intelligent learning environment, secondly, to open and share high-quality resources, to narrow the digital divide in education, to promote the deep integration of digital technology and education, and to build a new education ecology, fourth, to innovate education and teaching methods, which can improve the digital literacy of teachers and students.

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