

# Chapter 16

## Strive to Build a Smart Education Public Service System with “Six Standards”



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### 16.1 Background

In February 2021, Shenzhen was selected for the list of regions created by the Ministry of Education’s 2020 “Smart Education Demonstration Zone”. According to the overall deployment and work requirements of the Ministry of Education on the construction of “Smart Education Demonstration Zone” and the actual situation of our city, the *implementation plan of “Smart Education Demonstration Zone in Shenzhen”* was formulated, and the work of smart education demonstration zone was fully started.

According to the *Implementation Opinions on Accelerating Degree Construction and Promoting High-quality Development of Basic Education* issued by Shenzhen Municipal Party Committee and Municipal Government, by 2025, there will be 1 million new degrees in basic education, and nearly 400 new schools need to be renovated and expanded. This is an unprecedented “super project” in the history of Shenzhen education. Shenzhen education needs to take intelligence as the path and means to deal with a series of challenges, such as the balance of high-quality education, the development of school characteristics and the cultivation of innovative talents.

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## 16.2 Key Initiatives and Results

### 16.2.1 *Plan the Path of Smart Education Public Services*

**Plan for the development of education in the 14th Five-Year Plan and highlight the vision of smart education.** In the *14th Five-Year Plan for Education Development of Shenzhen*, it is clearly proposed to build a national smart education demonstration zone. The *14th Five-Year Plan for Basic Education Informatization in Shenzhen* proposes to rely on the core engine status of Shenzhen Bay Area, integrate resources from all parties, focus on consolidating the digital foundation of Shenzhen education, build a “Pengjiao intelligent community”, empower the high-quality development of education, realize the digital transformation of Shenzhen education, accelerate the promotion of intelligent upgrading, and comprehensively expand the radiation role and influence of smart education in the Bay Area. The above policy documents show the vision and goals featuring smart education.

**Clarify the positioning of the city, promote the implementation of smart education. In terms of new infrastructure,** it is clear to further strengthen the construction of new education infrastructure, and propose smart education infrastructure improvement projects, intelligent campus construction projects, and BIM/CIM projects for campus management; In terms of talent team, the *Implementation Plan of Shenzhen Smart Education Pilot Talent Training Project (2022–2025)* was formulated and issued; In terms of education data, the Shenzhen local standard *Classroom Teaching Behavior Data Exchange Specification (DB4403T 198–2021)* was formulated and released; In terms of teaching and learning organization, the study issued the *Guiding Opinions of the Shenzhen Municipal Bureau of Education on the Normalization of Online and Offline Hybrid Teaching in Ordinary Primary and Secondary Schools*.

### 16.2.2 *Draw a Blueprint for Smart Education Public Services*

The education public management service platform has been preliminarily built, and the unified portal, unified identity authentication, single sign-on, open development, information exchange, unified big data and integrated operation and maintenance capabilities of Shenzhen education management are provided.

#### 16.2.2.1 **Establish a Digital Pedestal for the Education System to Support the city’s Large-Scale Epidemic Prevention for All People**

**Develop a health data system in the field of education to achieve dynamic updates. The system entered the whitelist information of 2.82 million teachers,**

students and employees in the city, including all school students, teaching staff, logistics personnel, family members living on campus and third-party special operation personnel in Shenzhen, and dynamically updated the “Yue Kang code”, nucleic acid testing and new coronavirus vaccination data of all the aforementioned personnel every day. In the spring semester of 2022, Shenzhen Education Organization 2,832 schools created 3,188 school codes, 349,384 Faculty and staff completed health declarations and created 58,143 class codes, 2,510,922 students completed health declarations. Determine whether teachers, students and staff meet the conditions for returning to school according to health information, health code color, and nucleic acid testing, assist schools in completing statistics and management, and effectively reduce the pressure of epidemic prevention management in various districts and schools.

**The development of class group codes enables real-time collection of large-scale health information data.** On May 31, the Shenzhen Municipal Bureau of Education issued the Notice on Promoting the Application of the “Group Code” Function of the Guangdong Provincial Affairs APP in School Epidemic Prevention Work, encouraging all schools in the city to apply the “group code” to school epidemic prevention work in combination with their own epidemic prevention management needs, so as to reduce the burden on schools, staff and students’ parents. As of June 24, the number of “class group codes” created in schools in Shenzhen has reached 100,000, and the number of binding people has exceeded 4 million.

#### **16.2.2.2 Rely on the “Shenzhihui” Platform to Help Make Decisions on Degree Construction**

Shenzhen has built a three-year cycle of education “one-network unified management” education governance system, continuously improved the level of intelligent management, and built an education data capability service system. Uniformly carry out data aggregation, storage, sharing, and governance, build a data management and service operation system, promote more national and provincial business systems to share data in Shenzhen, and regularly compare data correction mechanisms with education administrative departments and schools in various districts, promote the coordinated linkage of education statistics and business data, strengthen the docking with authoritative basic data sources such as the city’s population, legal persons, housing, natural resources, and spatial geography, and gradually improve the city’s data resources in the field of education.

### ***16.2.3 Promote the Innovation of Smart Education Public Service Models***

#### **16.2.3.1 In-Depth Construction of Cloud Schools to Promote Future Education Practice and Mechanism Innovation**

As the world's first innovative school that uses physical schools to run Internet education, Shenzhen Cloud School has explored the dual-teacher teaching mode of "main lecture + auxiliary lecture, online + offline", realizing cross-school sharing of high-quality classrooms and rapid growth of young teachers.

In terms of teaching, "normalization, multi-main lectures, live broadcast interaction + intelligent assistance" makes "teaching" more intelligent and diverse, and invites famous teachers to their classrooms; Layered personalized cloud assignments are targeted at students' learning and promote individualized teaching. In terms of learning, the self-learning mode of "cross-school group classes, multi-teacher collaboration, optimal student assistance, seamless online/offline integration, and free switching" makes "learning" more free and autonomous; The good interaction of the online classroom greatly stimulates students' internal motivation and promotes students' group learning and research learning. "8:30 tonight" cloud teachers answered questions online, solved the problem of students' after-school homework guidance, and effectively implemented the "double reduction" policy. In terms of teaching and research, the embedded teaching and research mode of "municipal teaching and research staff stationed on-site guidance, led by famous teachers in the city" makes "research" more accurate and profound.

#### **16.2.3.2 Explore a Hybrid Online and Offline Teaching Model to Ensure that Teachers and Students Teach and Learn Simultaneously**

In the face of the new problems and new situations brought by the epidemic to teaching, primary and secondary schools in Shenzhen have actively explored a new hybrid online and offline teaching mode that meets the development needs of the intelligent era, so as to ensure that teachers who have not returned to school for some reason can teach synchronously and students can learn synchronously.

After returning to school in April, the affiliated school of Longhua District Academy of Education Sciences still has 2 teachers and 28 students in the lockdown or control area, and 5 Students in Shenzhen Welfare Institute, the school ensures the synchronous teaching and learning of these teachers and students with blended teaching. Qilin Middle School of Nanshan Experimental Education Group adopts a mixed teaching model and a teaching assistant follow-up mechanism to cope with the situation that teachers and students cannot return to school on time due to epidemic prevention and control.

### ***16.2.4 Construct Public Service Resources for Smart Education***

**Shenzhen Education Cloud Platform realizes a large resource system with full coverage.** At present, Shenzhen has developed 7866 online teaching course resource packages, which are free and open 40,000 high-quality lessons, covering a total of 45 subjects in primary, junior high and high schools. A total of 4,543 homework examples were developed for 12 subjects in primary and junior high schools. In addition to subject content, there are also 9 thematic education contents such as patriotic education and health and hygiene. During the online teaching period in the spring semester of 2022, from February 21 to April 19, the number of visits to the Shenzhen Education Cloud Resource Platform exceeded 18 million visitors, with a maximum of 1.35 million visits in a single day. The teaching resource package based on micro-video effectively helps teachers to carry out online teaching and promote the quality and balance of online teaching. In addition to subject curriculum resources, there are also a variety of art resources such as online concerts, and “aesthetic education micro-classrooms”, to enrich children’s cultural and entertainment life and achieve educating five domains at the same time.

**Resource application data analysis explores a new pay-for-performance mechanism. At the same time, the education cloud platform explores a new mechanism for pay-for-performance resource construction, innovates the digital resource generation model, upgrades the digital resource ecological environment, and gradually builds an open, integrated and high-quality digital education resource service system.** In 2021, Shenzhen carried out classroom teaching behavior data collection and application evaluation activities, and at the same time, using the education cloud big data analysis capability, the anonymous and desensitized classroom behavior data was analyzed and mined to form a diagnostic report with school characteristics, providing data decision support for optimizing teaching methods and improving the quality of education and teaching.

### ***16.2.5 Build a Smart Education Public Service Team***

**The “Pioneer Teacher Innovation Class” explores new forms of future teachers.** The “Pioneer Teacher Innovation Class” of the Shenzhen education system selects 25 young backbone teachers from the whole city to participate in the training and conducts two sessions a year to explore new forms of future teachers. The training is conducted in the form of “five-stage training + mentor training”, which includes five stages: theoretical research, thematic network training, research and study, visits, learning and posting, and promotion and summary. At present, two phases of training for 50 young backbone teachers with demonstration and leadership have been completed. After Zhang Sheng, a teacher at Shenzhen No. 3 Senior High School,

participated in the pioneer program, he regularly used virtual reality and other information technology to visualize subject knowledge in the classroom, guide teachers of other disciplines to solve teaching problems, and truly play the “pioneer” role of pioneer teachers.

**Launch the smart education pilot talent training project.** On April 2, the Shenzhen Municipal Bureau of Education issued the “Implementation Plan for Shenzhen Smart Education Pilot Talent Training Project (2022–2025)”, establishing and improving the echelon of smart education talents and cultivating a group of high-quality professional and innovative teachers who meet the needs of smart education. Provide important intellectual support and talent guarantee for the pilot demonstration of basic education in Shenzhen.

### *16.2.6 Improve Regional Smart Education Public Services*

**The cross-departmental coordination mechanism promotes work efficiently and pragmatically.** Coordinate the administrative departments, teaching and research departments, and information departments of the coordinating organs to jointly promote and coordinate development, integrate and optimize the positioning and functions of institutions, establish and improve the flow mechanism of information and resources in the construction of smart education demonstration zones, and promote efficient coordination. For example, the basic education department is responsible for overall planning, supervision and inspection and other overall promotion work, the education department is responsible for the guidance and practical work such as curriculum construction, teacher training, and project research, and the education information technology center is responsible for program planning, standard formulation, resource construction, application training, etc.

**The cooperation between the city, district and school communities is flexible and orderly.** As a city-wide promotion unit, Shenzhen adhered to the coordination between the municipal level and the district school at the beginning of the planning to build a three-level cooperation community of the urban school. At the municipal level, strengthen top-level design and overall planning, formulate and issue policy documents, plan and deploy overall construction work, promote the implementation of key municipal projects, and formulate work plans around district-level projects in each district to activate the kinetic energy of schools in the region and actively promote it. In the cross-regional exchange work plan, the city-level overall annual plan is planned, and multiple districts are organized to exchange and display results every quarter according to the direction of experimental projects, and school representatives display the results of school-based pilots in combination with regional characteristics.

## **16.3 Features and Experience**

Shenzhen has made all-around efforts to promote the construction of smart education demonstration zones, boldly carried out mechanism construction and innovation, and actively created a new situation for the integrated development of urban schools.

### ***16.3.1 Districts and Schools Become Co-Builders of Smart Education***

Shenzhen guides all districts to choose appropriate project directions based on the actual needs and basic conditions of the region on the basis of retaining regional characteristics, and systematically promotes reform experiments. The district-level experimental project adopts the “1 + 2” model, and each district chooses one of the three experimental directions of curriculum reform and interdisciplinary integration, teaching and learning model innovation, and big data collection and application, and carries out teacher team construction and institutional mechanism reform at the same time. According to the principle of regional balance, the Shenzhen Municipal Education Bureau selected 100 experimental schools in the city, covering public and private schools in multiple sections such as primary schools, junior high schools and high schools. According to the “theme + self-selection” model, 100 experimental schools focus on 18 experimental sub-directions such as teaching and learning mode exploration and carry out special pilots to explore advanced experiences and typical models.

### ***16.3.2 Future Teachers Build a Smart Education Construction***

Since 2017, Shenzhen has established a management system for the construction of chief information officers (CIOs) in basic education, and increased the intensity of information literacy and leadership improvement of principals. Shenzhen has completed the CIO training of 624 primary and secondary school principals and vice principals. Nanshan District implements the “1 + 1 + N” leading talent training plan for education informatization, and the pilot primary and secondary schools in the district are led by one famous subject teacher and one subject technical tutor. In the way of N subject teachers, an online master teacher studio is organized, so that the two teams of subject technology tutors and education technology teachers can improve their abilities in working together to tackle tough problems.

In the construction of the “Smart Education Demonstration Zone”, Shenzhen will pay closer attention to the overall requirements of the Ministry of Education, implement the mission of building a socialist pilot demonstration zone, focus on

the connotation of the “Smart Education Demonstration Zone”, promote the supply-side reform of resources in the education system, establish a high-quality education resource supply mechanism that serves urban development, form a collaborative sharing and integration mechanism to serve the construction of the Bay Area, explore a top-notch innovative talent training mechanism that supports the national strategy, and establish a model for smart education public services.