



# China Case Study

Situation Analysis on the Effects  
of and Responses to COVID-19  
on the Education Sector in Asia



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October 2021

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# Foreword

The pandemic caused a major children's rights crisis: all service sectors being profoundly impacted, with the most disadvantaged being disproportionately affected.

COVID-19 – possibly the largest pandemic the world has ever seen- led to an economic crisis probably more radical and global than ever before; as well as disruption of learning on an unprecedented scale. The pandemic caused a major children's rights crisis: all service sectors being profoundly impacted, with the most disadvantaged being disproportionately affected.

In response, with support from the Global Partnership for Education, UNICEF and UNESCO joined forces with Mott MacDonald, Cambridge Education to carry out a situation analysis, primarily to generate analyses to inform strategic responses to the crisis going forward. While the extension and duration of the pandemic required to invest more time to produce the final analyses and reports, fortunately information had already been discussed through webinars and national conversations with Ministries of Education and other partners across large parts of the Asia Pacific region.

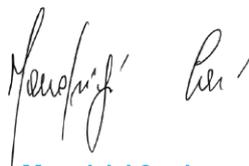
Furthermore, the reports continue to be of utmost relevance given subsequent waves of COVID-19 sweeping across the world in 2021 and very likely in 2022 as well. The task of learning from the crisis and how to mitigate its effects in education is on-going. More than one academic year has now been lost for many children. To ensure continuity of learning whilst schools are closed, the delivery of education is radically changing today through distance education: digital, blended or hybrid learning have become part of the new learning reality which all Governments, teachers and learners will have to adjust to.

While major efforts are needed to mitigate the learning loss of those children who return to school in the post-COVID-19 recovery phase, we must also remember that many children were not learning before the crisis and several million were not even in schools. The reports therefore also explore opportunities to build back better and to re-imagine education; to shift from fact-based didactic methodologies to competency-based approaches, which are more flexible, better respond to the holistic needs and aspirations of all children, and provide opportunities for life-long learning as per the Sustainable Development Goals (SDG) 4 agenda.

While the suite of reports provided within the Regional Situation Analysis are particularly relevant to the Asia Pacific region, contexts of course vary considerably across our huge region. At the same time, the reports may also provide insights that are relevant to other regions around the world. Hopefully the findings, including the country case studies, and regional budget needs analysis will help governments resume and accelerate progress towards SDG 4. The way education is conceptualized and delivered is changing fast, and the transformation journey will be steep and full of challenges. Governments, donors, all partners and the private sector will need to work together, not only to get the strategies and levels of investment right, but to build more resilient, effective and inclusive systems, able to deliver on the promise of education as a fundamental human right for all children, whether schools are open or closed.



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# List of acronyms

<b>BAES</b>	Beijing Academy of Educational Science
<b>CNNIC</b>	China Internet Network Information Center
<b>CETV</b>	China Education Television
<b>CCTV</b>	China Central Television
<b>CPC</b>	Communist Party of China
<b>COVID-19</b>	Coronavirus disease
<b>DCUL</b>	Disrupted Classes, Undisrupted Learning
<b>ICT</b>	Information and Communication Technology
<b>EMIS</b>	Education Management Information System
<b>ECCE</b>	Early Childhood Care and Education
<b>MOE</b>	Ministry of Education of the People's Republic of China
<b>MIIT</b>	Ministry of Industry and Information Technology
<b>MCA</b>	Ministry of Civil Affairs
<b>CHINA CDC</b>	Chinese Center for Disease Control and Prevention
<b>NNCP</b>	National Network Cloud Platform for Primary and Secondary School
<b>NTPP</b>	National Teacher Training Program
<b>ODME</b>	Online Dual Master Escorting
<b>NMLERD</b>	Outline of China's National Plan for Medium and Long-term Education Reform and Development
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>PISA</b>	Programme for International Student Assessment
<b>SARS</b>	Severe Acute Respiratory Syndrome
<b>TEOS</b>	Two Exemptions, One Subsidy
<b>WASH</b>	Water, Sanitation and Hygiene
<b>WCEC</b>	Wuhan Continuing Education Centre for Primary and Secondary Principals and Teachers
<b>WEB</b>	Wuhan Education Bureau
<b>WECP</b>	Wuhan Education Cloud Platform
<b>WAES</b>	Wuhan Academy of Educational Science

# Executive summary

The People's Republic of China (hereafter 'China') has the most extensive education system in the world, with 282 million<sup>1</sup> students and 17.32 million full-time teachers in over 530,000 schools across the country. The attendance rate of students in their nine-year compulsory education exceeded average levels recorded in high-income countries. The net turnout rate of primary students reached 95 per cent<sup>2</sup>, with lower secondary at 73 per cent. Some rural areas, however, still experienced persistent drop-out rates, especially with secondary students, due to education quality issues and poverty. In recent decades China has built a world-class primary and secondary education system, in line with its remarkable economic and social development.

The pandemic had an immense impact on all aspects of life in China, including the education sector. Globally, China was the first country to deal with COVID-19. However, due to the outbreak of SARS in 2003, a responsive and transparent emergency system was gradually built, which laid a good foundation to contain the more challenging COVID-19. Interventions from all stakeholders were aligned for a safe, resilient and inclusive recovery. All schools were closed on 17 February, 2020, but started to reopen in March, before fully reopening in September in a gradual manner. Importantly, it managed to open and operate schools with no reports of cluster transmissions.

This case study is part of a series of reports across Asia commissioned by UNICEF and UNESCO to share good practices and lessons across countries. Drawing on key insights and accounts shared by education officials, administrators and stakeholders in Wuhan (including teachers, students and parents), Beijing and Pingliang, the case study outlines the challenges China confronted to implement nationwide distance education, and highlights successful experiences and lessons learned from the initiatives. This is followed by recommendations to build-back better by constructing a more resilient response, and inform future educational development and reforms.

With a brief introduction on the background, methodology and report structure in Chapter 1, Chapter 2 then sets out the impact of COVID-19 on the education sector in China and its reply at speed and scale. The response aimed to tackle the threats and challenges posed by the pandemic, and provide support to sustain education continuity – especially for vulnerable groups.

## Effects and challenges of COVID-19

The unprecedented outbreak of COVID-19 brought China into static lockdowns. School closures were regarded as an effective measure to contain the spread of the pandemic. However, it posed unprecedented challenges for the continuity of quality education and learning for all.

- How to keep about 282 million students learning and protect their health and well-being during the pandemic?** All schools were shut down on 17 February, 2020 in order to protect the safety of students and teachers and contain the spread of COVID-19. The large-scale and sudden school closures stopped regular face-to-face teaching and learning, and hampered the provision of education services to children – especially those from poor families and in remote areas due to the lack of access to internet and devices. In addition, there were increased risks of children developing physical and psychological problems while isolating at home during lockdowns.
- How to equip teachers with the right digital skills at speed to deliver online teaching effectively?** Regardless of gender, age, experience, education background and location, teachers had to rapidly adapt from face-to-face education to distance teaching and learning. They needed a totally different set of knowledge and skills to do this, not only in curriculum, pedagogy, and assessment, but also digital instructional tools, platforms and facilities. The pandemic pushed teachers to the forefront of the education response, where they had to confront a variety of challenges faster than previously thought possible.
- How to guarantee access to education for children from poor and migrant worker families in remote areas?** Data from the National Bureau of Statistics showed there was a 6.8 per cent drop in gross domestic product (GDP) in the first quarter of 2020. From January to March, the number of job opportunities and recruited employees also shrank by more than 27 per cent, compared to the same period in 2019<sup>3</sup>. Income of migrant workers was reduced or lost, as they were unable to return to work due to

travel restrictions and lockdown measures. Livelihoods of families were threatened in an unprecedented way. This led to a significant toll on the poor and vulnerable, for whom access to education was affected. At the same time, lack of computers and the internet in poor families and remote areas also restricted disadvantaged groups to access and participate in online education.

- **How to develop a systematic emergency response by joint efforts of the government at all levels?**

With the world's largest school population, as well as diversified levels in quality of Information and Communication Technology (ICT) infrastructure, it was challenging to provide online classes to keep all students learning and to prepare facilities for reopening in China. Coordinating between central and school levels within the education sector, as well as across different sectors to initiate and manage a prompt and effective response, generated heavy workloads and organizational challenges.

## Mitigating learning losses and protecting health and well-being

A holistic and combined effort was made to respond effectively to the emergency at the ministry, provincial, municipal, and school levels, and a national distance education strategy was deployed to reduce the impact of the pandemic. Measures were taken in the following dimensions:

- **Learning continuity:** Disrupted Classes Undisrupted Learning (DCUL) was delivered to ensure learning continuity for students. Overall, 22 provincial online learning platforms plus one TV channel were mobilized at the national level, while various provincial, municipal and school-based platforms and TV programming complemented them. Online learning resources were made available on the [National Network Cloud-Platform for Educational Resources and Public Service](#), which allowed access via computer, mobile phones and tablet PCs. Free textbooks and learning packages were posted to children without access to internet or TV. Private education companies contributed both their products and services to enable free access to teachers and students.
- **Safe operations and community participation:** The government developed and updated policies and protocols on epidemic prevention and control, hand-washing habits and methods, distancing measures, etc., to guide schools and prepare for reopening.

Communities took active measures to reduce safety risks. Efforts were specially made to strengthen water, sanitation and hygiene (WASH) facilities such as increasing the student-water tap ratio from 50:1 to 20:1<sup>4</sup>. All schools were reopened in September 2020 and have operated safely, with few intermittent school closures thereafter.

- **Health and well-being:** The Ministry of Education of the People's Republic of China (MoE) prioritized the health and well-being of all children. The curriculum allowed space for physical exercise, and comprehensive psychological support was offered at three stages ('Prior to reopening', 'Part of the reopening process', and 'With schools reopened'). This support included protocols, hotlines, online lessons and videos. Guidance was also provided through parent committees and parent schools<sup>5</sup>. Due to online learning through digital devices, the rate of myopia increased, so eyesight protection was focused upon by key stakeholders<sup>6</sup>. MoE also worked jointly with the other five departments to create a healthy network environment to protect students from cyberbullying, games, and inappropriate sexual content, etc<sup>7</sup>.
- **Financial support:** An array of measures were introduced to enable an agile and rapid response, and to support the economic recovery process. A set of supportive policies were issued at each of the aforementioned three stages. Financial assistance was provided to ensure education continuity, including fee reduction, exemption of tuition, and subsidies, etc. Free devices and take-away learning packages, an internet subsidy, and a special living allowance were among initiatives offered to vulnerable groups to guarantee their education access and promote equitable schooling.

Chapter 3 presents a case study focusing on one area of China's successful response to COVID-19, the launch of the aforementioned DCUL. The DCUL case demonstrated a good example of how to sustain education continuity for a huge student population by launching large-scale distance education under strict lockdowns and travel restrictions. Beijing, Wuhan and Pingliang were selected as representative areas from different contexts to take a closer look at DCUL delivery at a municipal level, and to share best practice.

## Deep dive into DCUL implementation

To implement DCUL effectively, a number of challenges lay ahead, including providing equitable learning access for about 200 million primary and secondary students, offering diversified high-quality online learning packages to meet individual needs, improving the teaching function of existing online education platforms, balancing teaching plans for elite schools and disadvantaged schools, and ensuring examinees were not disadvantaged for high-stake exams. The deep dive into DCUL analysed the measures taken for implementing an inclusive and equitable distance education, as well as its strength and areas for further development.

- **Education system:** MoE integrated resources at all levels to ensure DCUL delivery and provided guidance booklets. Cooperation between developed and underdeveloped regions was advocated for comprehensive coverage of students.
- **Internet access to support DCUL – fibre coverage was expanded quickly to support online teaching:** Efforts were made to improve network connectivity and provide free devices. Discounted or free internet packages were offered for vulnerable groups mainly based on poverty.

- **Schools, teachers, learners and parents:** Key stakeholders were mobilized by the government to play their role and united to implement DCUL from different aspects.
- **Diversified learning resources and packages:** High-quality and rich learning resources such as the Ministerial and Provincial Model Courses were available to support the delivery of DCUL at the national, provincial, municipal, district and school levels. Master teachers were organized to develop resources to reduce pressure on ordinary teachers.
- **Adapted curriculum:** The curriculum was adapted based on the length of time, structure of distance learning, the content, and cognitive characteristics, etc.
- **Monitoring and evaluation:** Online inspection and research was carried out through different modalities and frequency to support teachers in online teaching. Timely advice was provided for typical issues identified in the distance teaching and learning, while good practice was shared with more teachers in the schools and districts.
- **Public-private partnership:** Private educational companies voluntarily offered free access to their service and products, especially for vulnerable students like those from poor families and in areas affected by COVID-19. This enriched the resource provision for distance learning.



DCUL was rolled out to all regions on 17 February, 2020 as the national response to ensure continuity of learning. It finished in June, but the duration varied from province to province depending on how long it took to curb the spread of COVID-19 and reopen schools. A snapshot showcases DCUL implementation in three different regions:

- **DCUL in Beijing:** An all-media learning solution was offered for students in the capital. Systematic trainings were organized to prepare schools, teachers, students and parents for distance learning, with follow-up support provided. Layered municipal and school-based resources were developed to meet individual student needs. Quality and effectiveness of DCUL was the focus of teachers and students.
- **DCUL in Wuhan:** DCUL was implemented in a systematic way led by Wuhan Education Bureau. A timely policy guide was provided to support the delivery. Specific strategies were developed for all primary and junior secondary schools at the district level, such as development of teaching and learning plans and video lessons. Customized individual action plans were formulated for every senior high school. Education continuity of children from poor families, who or whose family members were infected, of migrant workers, and whose parents were health-care workers was the main focus of attention.
- **DCUL in Pingliang:** DCUL ensured undisrupted learning for students in Pingliang, but faced more challenges in learning facilities, skills, resources and environment. Measures were taken to reduce the gap among urban and rural students and prevent dropout rates. Regular monitoring and evaluation on the quality of DCUL implementation was carried out to inform DCUL practice.

The analysis of DCUL practices revealed interesting findings in the areas of access and outcomes of vulnerable groups, learning resources, achievement and losses, teacher skills, parental support and psychological support, cross-department cooperation, and public-private partnership.

Chapter 4 presents lessons learned from the case study and recommendations, which consider ways to build on the successes, plans and lessons learned from the COVID-19 experience. They are aligned with the 13th Five-year Plan and Outline of China's National Plan for Medium and Long-term Education Reform and Development 2010-2020 (NMLERD). They are summarized below:

- Increase investment to build on the existing teaching and learning resources and inform the provision of more localized and tailor-made ones and develop;
- Enhance the capacity of teachers to conduct student-centred blended education;
- Cultivate more independent learners to improve outcomes and be better prepared for life-long learning;
- Reduce the digital gap and its impact on education equity for children in remote and rural areas;
- Strengthen data-informed monitoring and evaluation; and
- Review the overall effect of the investment in educational technology to improve future construction plans, and support educational development.

In conclusion, DCUL has generally achieved its goal of offering equitable access to distance education for all children. It revealed challenges for further improvement, such as online learning quality and outcomes. The COVID-19 pandemic has been transforming the traditional teaching and learning model, which is also a big incentive/motivation to drive innovations on integration of digital technology in teaching, future learning models, teaching and assessment, and policies to support vulnerable groups.

As COVID-19 continues to challenge education provisions in countries around the world, China is still scaling up its education responses through better-informed and tailored policymaking, strong public-private partnerships, and institutional development to achieve recovery and rebuilding. Swift, adaptive and collaborative efforts will be critical to achieve lifelong learning goals in the region.

# Country fact sheet

The table below provides a snapshot of the pandemic, the response of the education sector and some background information.

DIMENSION	INDICATOR/QUESTION	INFORMATION
<b>Epidemiology<sup>8</sup></b>	Date of first confirmed case	31 December, 2019.
	Date of first confirmed death	11 January, 2020.
	COVID-19 cases and deaths over time	99,191 cases including 4,807 deaths (As of 20 January, 2021) <sup>9</sup> .
	Details about the pandemic and Government responses and supports	During the initial period, when the seriousness of the virus was being assessed, the pandemic was limited to Wuhan. The government responded quickly, locking down the city and conducting mass testing. The virus spread further to other locations and a nation-wide lockdown was introduced.
<b>School closure</b>	Were schools closed partially or fully?	The Ministry decided to close all schools on 17 February, 2020.
	Date of school closures	17 February, 2020.
	Date of school reopening	Early March 2020 started from Grade 12 and/or 9 to other grades in secondary schools, and then primary schools and kindergartens in Qinghai, Guizhou, Xinjiang, Ningxia, Yunnan, Inner Mongolia, Tibet, Shanxi, Jiangsu, and Shaanxi in a gradual manner. More provinces reopened schools in April, May, and June, 2020.
	Have schools reopened fully or partially?	Schools reopened fully in September, 2020.
<b>Key vulnerable groups</b>	Key vulnerable groups affected by the impact of COVID-19 on the education sector	<ul style="list-style-type: none"> <li>Children from poor families.</li> <li>Children in remote and rural areas.</li> <li>Children whose parents are medical staff.</li> <li>Children whose family members were infected.</li> <li>Children with disabilities.</li> <li>Children from ethnic minority groups.</li> </ul>
<b>Education system structure</b>	Brief description of the structure of the education system – federal or centralized	<p>China has the largest state-run education system in the world. It offers nine years of government-funded compulsory education, which includes six years of primary school and three years of junior high school.</p> <p>It is a hybrid system that is highly centralized in terms of policy development and decision-making. At the same time, it is decentralized in the actual educational delivery and implementation.</p> <p>A four-level educational management system is adopted, including in the central, provincial, municipal and county. County education bureaus play a key role in basic education, supported by vertical hierarchical management. Vocational education has been gradually established under the leadership of the State Council, while the central and provincial governments take the lead in the management of higher education.</p>

Education Data <sup>10</sup>	Number of Students		Number of Schools		# Full-time Teachers	Student-Teacher Ratio (Public)
	Total	Private	Total	Private		
ECCE	47,138,800	26,494,400	281,200	173,200	2,763,100	15.9:1
Primary Education	105,612,400	9,449,100	160,100	6,228	6,269,100	16.9:1
Junior Secondary	48,271,400	6,874,000	52,400	5,793	3,747,400	12.9:1
Special Education	794,600	NA	2,192	NA	62,400	NA
Senior Secondary (Regular Senior Secondary Schools)	39,949,000	3,596,800	24,400	3,427 <sup>11</sup>	1,859,242	13.0:1
Higher Education (Regular Higher Education Institutions)	40,020,000	7,088,300	2,688	757	1,740,100	18.0:1
<b>Pre-COVID-19 progress towards SDG4 indicators</b>	China managed to stay on track and continue to progress towards SDG4 targets.					
	2019 National Education Development Statistics <sup>12</sup> :					
	<b>Stage of Education</b>		<b>Net Enrolment Rate</b>			
	Primary Education		99.94%			
	<b>Stage of Education</b>		<b>Gross Enrolment Rate</b>			
	ECCE		83.4%			
	Junior Secondary Education		102.6%			
	Senior Secondary Education		89.5%			
	Higher Education		51.6%			
	Disabled Children (Compulsory Education Stage)		95% <sup>15</sup>			
	Retention Rate of Nine-year Compulsory Education		94.8%			

# 01

## Introduction



With its huge population and overcrowded cities, Asia is potentially very vulnerable to COVID-19, which spreads through close contact with infected people.

## 1.1. Background

The global nature of the COVID-19 pandemic makes it different, affecting the whole world with the twin shocks of a health emergency and an economic recession. This will lead to long-term costs on human capital accumulation, development prospects and welfare. The pandemic's containment measures have disproportionately affected the most vulnerable and marginalized members of society.

Some of the most susceptible children felt the side-effects of COVID-19 from the moment nationwide lockdowns were put in place to control its spread. Markets, workshops, farms and factories closed, leaving children and families stranded. For many, the fear and uncertainty continue. Some minorities find themselves stigmatized and accused of causing or spreading the virus, while deep-rooted inequalities in societies are being exposed.

With its huge population and overcrowded cities, Asia is potentially very vulnerable to COVID-19, which spreads through close contact with infected people. The contexts within which people of South Asia, South East Asia and East Asia are having to cope with the virus are vastly different, with a disparity in living conditions and varying degrees of access to, and quality of, essential services such as health and education. Across the continent there is vast inequality between rich and poor, and therefore different levels of resilience to the shocks that this disease has brought, putting the deprived at long-term risks far beyond contracting the virus. This region regularly suffers from calamities, which lead to localized learning interruptions. For example, during the pandemic, Cambodia and the Philippines were in the path of a cyclone, and recent floods have threatened communities.

This Situation Analysis has been undertaken as part of the broader examination initiated by UNICEF and UNESCO, to provide a snapshot of the educational responses and effects of COVID-19 across Asia. It considers the direct effects of school closures and reopening, and identifies the initial impact that this may have on learners, their families, and the overall education system. In doing so, it aims to develop insight based on the variety of responses to the pandemic, with a view to assessing their efficacy in Asia. It seeks understanding on the contextual factors that may have supported or hindered learning, with particular attention on the most disadvantaged groups (who will be most affected by the pandemic). For this, the analysis has the following objectives:

- To assess and estimate the various impacts of the COVID-19 epidemic on the education sector and stakeholders in Asia;
- To examine policy and financial implications on progress towards achieving SDG4-Education 2030; and
- To identify examples of promising responses and strategies in education and associated social sectors, which can be shared with other countries.

The Situation Analysis identifies examples of effective country approaches, which could be replicated or adapted for use in other countries. Following the development of the case studies (including this China situation analysis), the overall study will include an overview of the situation in each of the three Asian sub-regions, and finally the region as a whole.

## 1.2. Methodology

The study includes an overview of the situation in each of these three sub-regions, with case studies providing a more in-depth look at specific areas in 14 countries. The case studies have been supported by the UNICEF and UNESCO offices in each country. They have provided relevant information and assisted the researchers to contact relevant officials to collect country-specific documents, grey literature and data that will help us tell the story of the COVID-19 disruption across Asia, its impact, and the responses of each education system.

In addition to a literature review, the case study involved interviews with key stakeholders (listed in Annex A), which include UNICEF and UNESCO teams, teachers and principals from four primary schools in Wuhan, and government officials from the Wuhan Education Bureau, Wuhan Institute of Education and Science, and Wuhan Continuing Education Centre for Primary and Secondary School Principals and Teachers. This has provided an opportunity to learn more about the challenges faced and responses developed, and provided a space for discussion and debate on lessons learned and what still needs to be done.

## 1.3. Report structure

The case studies are structured in four sections. After this introduction and a country fact sheet, Chapter 2 discusses the effects of COVID-19 on the education system against four dimensions (see Figure 2 below). Challenges are identified and then the responses are set out against the three phases of school reopening (see Figure 1 below), depending on the specific context of each case study country. Chapter 3 provides a deep dive into a particular theme, which was identified in each case study country by the UNICEF and UNESCO country teams. Finally, Chapter 4 provides an overview of the lessons learned, providing specific recommendations for the case study country and other countries on building back better, increasing the resilience of the education system to future shocks, and reimagining education.

FIGURE 1 | THREE PHASES OF SCHOOL REOPENING



FIGURE 2 | FOUR DIMENSIONS OF ANALYSIS OF EFFECTS





# 02

## Effects of and response to COVID-19 on the education sector in China



Situated in eastern Asia, China is an upper-middle-income country and the world's second largest economy. But its per capita income is still only about a quarter of that of high-income countries, and about 373 million Chinese are living below the upper-middle-income poverty line of \$5.50 a day<sup>14</sup>. It has a population of 1.4 billion people.

With the world's largest population, China has the most extensive education system on the planet, with about 282 million students and 17.32 million full-time teachers in over 530,000 schools. School provision reflects the diversity of the country, with elite schools in the big cities coexisting with the vast numbers of schools in the countryside operating on completely different levels of quality<sup>15</sup>. The gap is mainly reflected in the distribution of education resources and quality of teaching. With the deepening of the urbanization process, better-trained teachers choose to work in elite schools located in developed first and second-tier cities, while remote cities or rural schools face the challenge of a lack of well-trained teachers due to geographical and economic development constraints.

Diversified schooling was offered to meet the needs of different groups of children, including public schools, private schools, international schools, and schools for children with special needs. A free nine-year compulsory education has been implemented since 1986, when China issued the Compulsory Education Law. The levels of education are set out in Table 1. The academic year in China is run as a two-semester system: Spring Semester is from February/March – June/July; and Autumn Semester is from September – December/January.

TABLE 1 | YEAR LEVELS OF PRIMARY AND SECONDARY EDUCATION IN CHINA

	ELEMENTARY SCHOOL	JUNIOR HIGH SCHOOL	SENIOR HIGH SCHOOL
Year Level	1st – 6th	1st – 3rd	1st – 3rd
(Grades)	(Grade 1 – 6)	(Grade 7- 9)	(Grade 10-12)

## 2.1. Profile of China education system prior to pandemic

*“Strengthening education is fundamental to our pursuit of national rejuvenation. We must give priority to education, further reform education, speed up its modernization and develop education in a way that people are satisfied with,” Chinese President Xi Jinping, also General Secretary of the Communist Party of China (CPC) Central Committee, said at the 19th CPC National Congress in October 2017<sup>16</sup>.*

The government has placed a high priority on education development, as it is regarded as key to the national strategy to revitalize the country. Constant efforts were made to deepen the reform of the educational system, and said reforms have yielded fruitful outcomes (Table 2). In general, the enrolled students are gender balanced. Girls take up 42 to 54 per cent at each stage of education<sup>17</sup>.

TABLE 2 | RESULTS OF BASIC EDUCATION REFORM SINCE THE PEOPLE'S REPUBLIC OF CHINA FOUNDED IN 1949<sup>18</sup>

TYPES OF DATA	1949	2015	
Literacy rate	20%	96.4%	
	1950	2019	2020 (Target) <sup>19</sup>
Gross enrolment rate of ECCE	0.4%	83.4%	70% (Target for Medium and Long-term)
	1949	2018	2020 (Target)
Net enrolment rate of primary education	20%	99.94%	94.8%
	1949	2019	2020 (Target)
Gross enrolment rate of junior secondary education	3.1%	102.6%	94.8%
Gross enrolment rate of senior secondary education	1.1%	89.5%	90%
Gross enrolment rate of higher education	0.26%	51.6%	40% (Target for medium and long-term)
Enrolment rate for children with disabilities	N/A	95%	95%*
Retention rate of nine-year compulsory education	N/A	94.8%	95%

\* [www.moe.gov.cn/jyb\\_xwfb/xw\\_fbh/moe\\_2069/xwfbh\\_2017n/xwfb\\_20170728/170728\\_mtbdb/201707/t20170731\\_310410.html](http://www.moe.gov.cn/jyb_xwfb/xw_fbh/moe_2069/xwfbh_2017n/xwfb_20170728/170728_mtbdb/201707/t20170731_310410.html)

China continued to make strides in the reform of basic education. The National Educational Development Statistics showed the gross enrolment rates in primary schools and junior high schools were 99.94 per cent and 102.6 per cent respectively as of 2019 (Table 2), exceeding their target values for 2020 as set in NMLERD. In the meantime, some areas are still combating dropout rates in compulsory education to make sure no child is left out of schooling, and guarantee the retention rate. As of 30 November, 2020 the registered number of dropouts in the education system had been reduced from 600,000 in early 2019 to 831 by the end of November 2020<sup>20</sup>.

The average number of years of education for the working-age population reached 10.7 in November 2020. Of new entrants into the workforce, 50.9 per cent had received higher schooling, with an average of 13.7 years of education<sup>21</sup>. Both of these indicators surpassed China's target for human resource development in the 13th Five-Year Plan.

China has established a student financial-aid policy system covering all education stages. From 2016 to 2020, a total of 391 million students from poor areas were supported, and the amount of financial assistance reached 773.9 billion yuan (approximately \$120.3 billion<sup>22</sup>). The national Nutrition Improvement Programme for Rural Compulsory Education Students covered 1,634 counties (more than half of the total counties in China), and more than 130,000 schools, benefiting over 37 million students.

In the last 10 to 15 years, the government has also strived to improve the basic public education services for pre-school provision. Two successive pre-school education action plans have been implemented, and the coverage of universally affordable kindergartens (charging childcare and accommodation fees at a government-directed price) has now reached 76 per cent. Meanwhile, 99.8 per cent of compulsory education schools (including teaching points<sup>23</sup>) have also met the basic operation requirements. The proportion of large-size classes (56 students and above in one class) has dropped from 12.7 per cent in 2016 to 3.98 per cent in 2020<sup>24</sup>.

At the compulsory education stage, the test-free admission to nearby schools and the policy of joint admission by public and private schools were fully implemented nationwide; test-free admission to nearby schools in 24 big cities has reached 98.6 per cent, while 85.3 per cent of children of migrant workers were admitted to public schools<sup>25</sup>.

Chinese students have been the top performers in reading, mathematics and science in the Organisation for Economic Co-operation and Development (OECD) Programme for

International Student Assessment (PISA) from Shanghai since 2009; Beijing, Jiangsu and Guangdong since 2015; and Zhejiang since 2018. The four regions took the PISA test and outperformed the majority of students from other education systems. Although these four provinces in eastern China do not represent all of China, each of them is actually as large as a typical OECD country, where income levels are well below the OECD average. The OECD China Education Quality Report explained that China's outstanding performance in PISA is the result of long-term support for a high-quality education system, which depends to a large extent on the quality of teachers. As one of PISA's outstanding education systems, China prioritizes the development of a strong teaching workforce in its policy agenda.

Improving the educational qualifications of teachers is one of the national educational development initiatives (see Table 3). Overall, there is still room for teachers to improve their entrance qualification, especially at the primary and junior secondary stage. Teachers from the poorest and most remote areas have been trained for about nine-million person-times<sup>26</sup> during the 13th Five-year Plan to improve the quality of education in rural schools. With regards to the salary, teachers are among the highest paid civil servants, ranking 7th among all the industries as shown in the data of National Bureau of Statistics in 2019<sup>27</sup>. However, there was a big difference between the salary of teachers in developed areas of eastern China and remote areas of central and western China. The government has tried to close the gap by providing additional incentives for teachers in rural areas.

**TABLE 3 | RATIO OF TEACHERS WITH QUALIFIED DEGREES IN 2019**

TYPES OF TEACHER	QUALIFICATION RATE	URBAN	RURAL
ECCE teachers (Graduated from senior high schools and above)	98.4%	99.34%	97.46%
Primary school teachers (Graduated from Senior High schools and above)	99.97%	99.99%	99.96%
Junior secondary teacher (Graduated from colleges and above)	99.88%	99.93%	99.85%
Teachers of general senior secondary schools (Graduated from universities and above)	98.6%	NA	NA
Higher education (Bachelor's degree and above)	75%	NA	NA

China has made noticeable achievements in improving the use of educational technology prior to the pandemic, which has played a key role in supporting education development<sup>28</sup>. MoE and the Ministry of Industry and Information Technology (MIIT) jointly implemented the 'School Networking Initiative'. Some salient features include:

- All teaching points in remote areas are fully covered by digital education resources;
- Internet access coverage in primary and secondary schools has increased from 25 per cent in 2012<sup>29</sup> to 99.7 per cent in 2020, and the proportion of multimedia classrooms has increased from less than 40 per cent to 95.2 per cent;
- The National Network Cloud-Platform for Education Resources and Public Service has been completed and 28 provincial platforms connected to the system;
- 20,000 national and provincial online demonstration lessons have been developed to strengthen classroom teaching;
- More than 10 million teachers and 10,000 head teachers in primary and secondary schools, and over 200,000 TVET teachers are trained in education technology to strengthen their capacities<sup>30</sup>;
- Online teaching models are rooted at the heart of teachers and students such as Massive Open Online Courses (MOOC), Small Private Online Courses (SPOC), micro-teaching, etc.; and
- Private educational companies have accumulated rich experience in delivering online teaching and learning such as VIPKid, TutorABC, Xueersi, etc.

## Challenges facing the education system

Along with the progress made in the education sector, a number of challenges lie ahead for the education system, with education quality and equity at the top. The high enrolment rates for basic education showed that education access is not a critical issue nationally, but the development of compulsory education in rural and urban areas is unbalanced. The quality of education in ethnic minority areas needs further development. Safeguards for inclusive pre-school education calls for more efforts to be put in place. Special education and specialized education reforms are still in their infancy. The system also encouraged diversified development of secondary education. Looking forward, these challenges are also listed as the focus for future reform in the National 14th Five-year Plan.

The number of dropouts reduced dramatically in the past five years and have reached an historic low. Sustaining the current low dropout rate will require systematic monitoring and ongoing efforts to make sure vulnerable children have access to compulsory education, particularly those who have been most affected by the pandemic.

The above outlines the priorities for development of education in China before COVID-19. Once the pandemic hit and affected the country in different ways, the ministry had to revise their plans, and large-scale online teaching became an emergency response. Although this resolution has its shortcomings, it provided a way to meet the urgent need for education continuity. The country can take this crisis as a turning point and strive to turn the emergency measures into an opportunity for education reform, integrate the flexibility and scalability of online teaching with offline teaching, fully enable new technologies such as big data, artificial intelligence, and 5G to play a better role in education reform, and promote the comprehensive, systematic, digital, and globalized transformation and development of education.

**“We cannot waste this crisis,” stressed Jaime Saavedra, World Bank Global Director of Education. “This shock might have lasting negative impacts, but it must be an opportunity to accelerate, not go back to where we were before. We will go to a new normal with a different understanding of the role of parents, teachers, and technology. A new normal that should be more effective, more resilient, more equitable, and more inclusive. We owe it to our children<sup>31</sup>.”**

## 2.2. Effects of COVID-19 against four dimensions (Access to and participation in learning, safe operations, health/well-being/protection, and finance)

The unexpected outbreak of COVID-19, first detected in Wuhan, quickly swept through the country and brought China suddenly into strict lockdowns in early 2020. The epidemic was regarded as a major public-health emergency; it had the fastest spread, the widest range of infections, and the most difficult prevention and control since the founding of the People's Republic of China in 1949. It touched every aspect of people's daily life. China has been responding effectively through a whole-nation mobilization approach. With united solidarity, the country has worked together to fight the virus. This section will briefly present a picture of the effects of COVID-19 in China, and how these were responded to.

As part of containment measures, all schools were closed. During the school closures, the DCUL initiative was launched to maintain learning continuity in the spring semester; that is, adopting distance teaching and learning via online platforms to replace face-to-face provision. Later, the schools gradually reopened based on the progress made in COVID-19 prevention and control. By the end of the spring semester in 2020, 202 million students had returned to campus, which accounted for 75 per cent of the total student population (Table 4). Most importantly, no cluster infection in schools has been reported between reopening and the date this report was written.

One emerging lesson from the coronavirus epidemic in China, as well as in the rest of the world, is that while everyone may be affected, those already vulnerable are likely to be more severely impacted. People who are already susceptible have less capacity to cope with the impact of infection; they have limited access to social services, medical or social protection, and have less capacity to cope economically with the consequences of an outbreak<sup>33</sup>.

Vulnerable groups were at risk of becoming more exposed during the pandemic. In the process of the educational crisis response, home learning, online teaching and other measures may result in greater inequalities for these groups. The development of educational information and technology was not balanced between regions and schools, so the outbreak was likely to further exacerbate the digital divide between the rich and better-resourced, and the poor and poorly equipped regions and schools. Some vulnerable groups had difficulty in obtaining adequate educational resources, which affected the goal of promoting equitable education. Many parents in poor families not only found it difficult to provide support for their children's learning, but also faced greater financial pressure due to job cuts or salary reduction.

Under the policy guidance of the education authorities, schools reached out to include disadvantaged groups in DCUL. Investigations were carried out to identify and register children from poor families, and those whose parents were medical staff and academically left-behind children. Individual support was then offered to guarantee their access to DCUL and mental health support, including tablet donation, free internet access, bandwidth improvement, posting paper-based textbooks, etc<sup>34</sup>. Children of medical workers, from poor families, whose parents lost jobs or were infected, were the four main target groups prioritized for financial assistance and student care during the pandemic.

TABLE 4 | COVID-19 SITUATION IN CHINA AS OF 20 JANUARY, 2021<sup>32</sup>

NAME	CASES – CUMULATIVE TOTAL	CASES – NEWLY REPORTED IN LAST 24 HOURS	DEATHS – CUMULATIVE TOTAL	DEATHS – NEWLY REPORTED IN LAST 24 HOURS	TRANSMISSION CLASSIFICATION
Global	94,963,847	496,206	2,050,857	12,933	
China	99,291	165	4,807	2	Cluster of cases

## Access to and participation in learning

The DCUL initiative, as discussed in more depth later in Chapter 3, was the main measure taken to sustain education continuity for students. However, studying at home alone via online platforms and resources had a negative impact on student participation in learning and their interaction with peers and teachers, when ordinary face-to-face classes were suspended.

### Learners

The epidemic disrupted ordinary education for all students. They had to adapt to online learning and experienced a variety of difficulties:

- Lack of self-learning abilities and self-regulation to learn effectively at home. DCUL shortened the length of online teaching based on the learning objectives. Students had to preview, review and complete tasks independently.
- Disengagement in online educational activities. It took time for students to develop online and independent learning skills. This resulted in poorer interaction and participation in their learning, which impacts on their outcomes.
- Potential damage to eyesight from watching video lessons for hours, especially primary school children. Though one lesson was limited to 15-20 minutes, they accumulated hours of close-screen work, as all lessons were recorded and presented to students through digital devices.
- Lack of computer and internet in poor families and remote areas limited disadvantaged groups' ability to access and participate in online education. As shown in recent statistics, Chinese households with internet access and a personal computer only accounted for 47.4 per cent and 46.7 per cent of all households respectively<sup>35</sup>.
- Increased risk of dropping out for children from poor families in remote areas and of migrant workers. Due to job losses, salary cuts and movement restrictions, the livelihood of low-income families were more likely to be deteriorated. This has directly contributed to an increase of drop-out risks for these children.
- Girls do more chores in families, then have less time to participate in learning – especially girls in rural areas and daughters of migrant workers. There was no updated data available on how much time girls spent in family chores during the pandemic. However, a China Family Panel Study in 2018 found that the time girls did chores was 4.08 hours weekly – much higher than the 2.91 hours per week for boys<sup>36</sup>. The Report on the

Survival and Development of Rural Girls in Central and Western China 2016 indicated that rural girls do more family chores and for longer periods of time<sup>37</sup>, and the Research on National Rural Left-behind Children (rural children whose parents left their hometowns to work, mostly in urban areas, while children remained in their domicile) showed that girls do more chores than boys.

From a quick review by MoE, the data showed that COVID-19 did not result in obvious dropout or attendance issues during the pandemic in China. As of 15 September, 2020, it is reported by MoE that the number of dropouts decreased from 600,000 in 2019 to 6,718 in June 2020, a decrease of about 98.9 per cent. It indicated that the pandemic did not have much impact on student access to education, although the participation and quality of access of vulnerable groups will still need more attention.

### Teachers

Like offline education, teachers played the most important role in guaranteeing the effectiveness of online teaching and learning. In China, MoE has been taking measures for decades to strengthen the ICT skills for teachers and integrate it with education provision. The Competence Standard of Teachers to Apply ICT in Primary and Secondary Schools (Phase 1) was completed and progressed to Phase 2. More than 10 million teachers were trained cumulatively. Over 80 per cent of primary and secondary teachers used ICT in their daily teaching<sup>38</sup>. They also initiated the Internet Plus Education Program and the National Teacher Trainings on ICT Skills Improvement. Tools, platforms, and the environment have been developed and established for online education. However, there were still gaps in teachers' knowledge and skills to use these tools and platforms effectively, as well as embedding modern ICT methods into teaching<sup>39</sup>. With the launch of large-scale distance education, teachers were confronted with five main challenges, listed below.

- Teachers were unfamiliar with the online teaching and learning platforms and tools. When schools all closed on 17 February, 2020, teachers had to cope with different types of platforms overnight, and deliver instruction to the students without preparation. Although ICT training has been part of the national training programmes, it turned out to be inadequate in responding to large-scale online teaching. It was challenging for the older teachers, who had taught for many years in ordinary face-to-face settings<sup>40</sup>, and rural teachers who were weaker with ICT applications, communication tools, online assessment and courseware development<sup>41</sup>.

- Teachers lacked pedagogical skills for online teaching. Online teaching was quite different from traditional classroom teaching. It required a set of different interactive, pedagogical and assessment skills. When teachers were suddenly forced to suspend normal teaching and shift to online instruction, they were confronted with great challenges due to their lack of online pedagogical experience.
- Increased workload for teachers to develop new teaching plans to meet the needs and model of online teaching. The existing teaching plans were developed for classroom teaching. To ensure the effectiveness of online teaching, educators had to re-develop teaching plans and collect resources to support the delivery, which took time and effort.
- Difficult to track and assess student progress in online teaching and learning. Virtual classrooms created an invisible distance between teachers and students. Without direct interaction, it is difficult to track the engagement of students in learning and assess outcomes, and provide useful feedback for the next lessons.
- Lack of knowledge and skills to provide psychological support for students. Many schools found that students were experiencing mental-health problems while studying at home. In the face of the pandemic, teachers stood at the forefront to reduce their anxiety or other mental issues by providing counselling in their daily interactions, for which teachers need more training and professional guidance.
- As a result of COVID-19, teachers were locked down at home to work and faced the challenge of adapting methods to use online teaching tools, platforms and methods overnight. Meanwhile, many are also parents and need to support online learning for their own children.

### Parents

Online education was not completely new to parents in China. Many private education companies and courses such as Xueersi, Yuanfudao, New Oriental, 51 Talk, and VIPKid were popular with their children, especially for English language studies. However, they did not play a critical role prior to COVID-19. During DCUL, parents were expected to take up new roles as children began to study at home. To some extent, parents had to act as tutors to



assist their children with learning and communicating with teachers. There was a gap in the school-home collaboration, and between levels of parental support in the urban and rural areas in China. Urban parents and grandparents worked together to support educating their children during lockdown, whereas many rural parents could not. The challenges facing parents included:

- Struggle to balance work, life and support for children while working at home – especially true for working parents.
- Difficulties in creating a positive learning environment to support the children's learning in more than one-child and rural families.
- Lack of academic knowledge and skills to mentor the study of children, especially low-income and rural families.
- Difficulties monitoring the children to finish all study tasks and homework assigned remotely by teachers while locked down at home, generating intense parent-child relationships.
- Lack of psychological skills to support children, reduce their anxiety to adapt to online learning, ease the tension for home-school, and worry about the uncertain impact of COVID-19.
- Stress of salary cuts, loss of jobs, economic contraction, etc., had a negative impact on parents and might lead to tension in family relationships.

## Safe operations

The unexpected crisis posed direct threats to the safety of school operations in China. By their nature, schools were an environment conducive to the spread of COVID-19. At the beginning of the pandemic, all schools were closed to reduce or stop its spread, but it was a temporary solution with possible high costs from learning disruptions<sup>42</sup>.

The preparation for reopening required a systematic response, with adequate WASH facilities, well-planned physical social-distancing measures, classroom setting, campus management, knowledge and expertise on infection prevention and control, etc. The government developed a comprehensive and systematic mechanism to prepare schools for reopening, as discussed in section 2.3.

In China, from 2011 to 2017, in the basic education sector the proportion of network-managed water supply schools increased from 54.2 per cent to 75.8 per cent; and the proportion of schools with sanitary toilets increased from 56.5 per cent to 80.1 per cent. Most schools with non-hygienic toilets are concentrated in the central and western regions. The toilets are separated by gender, but there are often the same or fewer squatting seats for girls than boys,

and it's more common for girls to wait in line. In addition, some school toilets are not private, and some schools do not provide accessible WASH facilities for children with disabilities<sup>43</sup>. MoE data showed that efforts continued to improve WASH conditions in schools. A focus was put on increasing access to safe water supply, sanitary latrines and handwashing facilities in rural schools and communities, so as to sustain the improvements in recent decades by the government<sup>44</sup>.

The quick and successful school reopening in China also proved that WASH facilities and safe operation generally met the basic requirements to prevent and halt the spread of COVID-19. The pandemic also revealed some issues existing with the facilities and operations, in particular areas such as the shortage of water taps, for which MoE developed action plans to address such issues.

## Health/well-being/protection

Nationwide school closures hampered the provision of educational and other services to children, especially the disadvantaged.

First, school closures disrupted access of children to nutritious food, life subsidies, school protection, etc., in the short term, while it increased the risk of dropping out in the long term. Leaving no one behind due to poverty, about 40.6 million students from poor families benefitted from Two Exemptions and One Subsidy (TEOS)<sup>45</sup>. TEOS is the state subsidy policy of providing free textbooks, exempting miscellaneous fees and subsidising certain living expenses for students from poor families in the stage of compulsory education in rural areas. In total, 29.02 billion yuan (approximately \$4.51 billion) was invested in the TEOS programme in 2019, while 21.26 billion yuan (approximately \$3.3 billion) was used to assist students in need for 105.91 million students accumulatively<sup>46</sup>. Despite of the crisis, TEOS subsidies reached out to support its target groups in 2020.

Second, all-round distance education increased the time children were using digital devices – not good for their eyesight. A survey was conducted by MoE on the impact by sampling 14,532 students from primary, middle and high schools in nine provinces during the epidemic. Compared to recent survey results at the end of 2019, it found that the myopia rate had increased by 15.2 per cent for primary students, 8.2 per cent for middle school students, and 3.8 per cent for senior high students in six months<sup>47</sup>. In-depth analysis was made and reached the conclusion that watching many video lessons had a direct negative impact on vision.

Third, the long lockdown disrupted children's normal life and created tensions among family members. During this period, there were no family trips, Spring Festival parties or fun with friends, creating an environment isolated from outsiders and social activities. The situation generated psychological problems in cognition, mood, behaviour, interpersonal communication, and somatization due to isolation and fear of the epidemic. According to a joint survey by the Social Survey Center of China Youth Daily and wenjuan.com (on 1,931 parents of primary and secondary school students), 97.1 per cent of parents were concerned about the psychological state of their children during this period, while 93 per cent felt that recent home study had negative impacts on their children's mental health<sup>48</sup>. The government and schools worked together to provide counselling for children and guidance for teachers and parents, which will be discussed in detail in section 2.3.

While children were overcoming the psychological challenges and adapting themselves to DCUL programmes, teachers stayed stable and remained as strong contributors to mitigate the impact of the virus. They were also facing great psycho-social health challenges of balancing between their new roles as educators for distance teaching, and parents supporting their own children's learning. There was no teacher attrition in public schools during the pandemic. All teachers received their full salary as before, but the work load was heavier as they needed to support student distance learning while implementing prevention and control measures to mitigate COVID-19.

## Finance

Since China began opening up and reforming its economy in 1978, the government attached great importance to the development of the education sector. As a share of the national GDP, public spending on education was increased considerably from around 2.5 per cent in the mid-1990s to 4.04 per cent<sup>49</sup> in 2019, when public spending on education reached 400.49 billion yuan<sup>50</sup>. However, when compared to developed countries, the total educational spending was still at the lower range. It did not reach the OECD average of around 5 per cent of GDP until 2015, while per-student spending remained far behind developed countries<sup>51</sup>. The spending per student on a tertiary level of education in OECD countries averaged nearly \$16,300 in 2017, but reached only 38,700 yuan (approximately \$6,017) per student in China in 2019<sup>52</sup>.

To date, the extent and nature of the financial impact of COVID-19 are not yet fully known, as the response continues and the potential risk of local resurgence remains. According to the National Bureau of Statistics, lockdowns and countermeasures against the pandemic resulted in a 6.8 per cent drop in GDP in the first quarter of 2020 compared to the previous year<sup>53</sup> – its first contraction since 1992. A longer containment period for the COVID-19 outbreak would cost China as much as \$692 billion in economic losses<sup>54</sup>. Under these circumstances, the impact on vulnerable households (and particularly on those that are below, or above but close to the poverty threshold line) seems higher because they are already susceptible<sup>55</sup>. The urban surveyed unemployment rate reached 6.2 per cent in February. A considerable number of low and middle-income groups (residents in rural areas and migrant populations, such as non-resident migrant workers in urban areas) were not included in the statistics<sup>56</sup>, for whom the rate was significantly higher. It was also reflected in the JingDong big data (provided by JD, one of the biggest e-commerce enterprises in China, who had rich national data on consumption) that urban employment opportunities were reduced during the epidemic, and migrant workers are hindered from returning to cities for work<sup>57</sup>.

With a gradual pick up of the economy and 'return to normality', the short-term impact of COVID-19 may be contained and absorbed. However, the longer-term impact may be greater: a large share of the population may have become more at risk of falling into or back into poverty, due to an unexpected drop in commodity prices or a poor harvest due to unfavourable weather events. The financial challenges would induce dropouts and negatively impact on the learning opportunities of children from these vulnerable families.

The Chinese Government has been aware of the main challenges and worked to reduce vulnerabilities, with a strategic focus on rural areas and families<sup>58</sup>. It has decided to prioritize its spending on education and maintain its original annual target of 4 per cent of GDP, despite financial constraints<sup>59</sup> and the fact that health care and virus prevention budgets to curb COVID-19 soared. Furthermore, special funding has been earmarked to prevent the possible spike of COVID-19 in schools, the amount of which varied greatly across provinces. Institutes were given the highest priority to ensure the quality and efficiency of rapid procurement through green channels (more handy, safer and faster channels).

## 2.3. Education sector response to COVID-19 and support to continuity of learning

Confronting the COVID-19 pandemic, countries around the world implemented a variety of responses. Of these, school closures were regarded as a potentially effective way to contain the transmission of COVID-19 when local transmission is extremely high, particularly at an early stage and during first waves of the pandemic. To respond to the public health crisis and mitigate its impact in the education sector, China was one of the first countries to close all schools, followed by comprehensive counter-measures including the extension of public holidays, postponing the start date of spring semester, mandatory and recommended quarantine measures as well as other national and international travel bans and restrictions. China managed to sustain education continuity and reopen all schools in September 2020.

The unprecedented large-scale online teaching and learning not only successfully responded to the crisis brought by the epidemic, but also set off learning reforms in China. With all the efforts, China managed to minimize the negative impact of COVID-19 while keeping on track to reach SDG 4 Education goals.

### Phase 1 - Prior to reopening (February to March 2020)

#### Access to and participation in learning

During the school closures, the free DCUL initiative was launched by MoE to cover all students. Twenty-two online learning platforms and one countrywide TV channel, plus a number of provincial TV channels, were coordinated by MoE to offer 24,000 free and open online courses at a national level. The National Network Cloud-Platform for Educational Resources and Public Service (<http://www.eduyun.cn>) was the biggest one to deliver and support DCUL, which was launched on 17 February, 2020. Access to the following platforms was offered on National Network Cloud-Platform for Educational Resources and Public Service:

National Network Cloud Platform for Primary and Secondary School (NNCP) provided high-quality learning resources for free for learners in primary and secondary schools. It could accommodate 50 million people to learn online at the same time, supported by 7,000 servers and 90TB bandwidth.

National Cloud-based Classroom provided live online training for teachers throughout the country. Its focus was on: improving the awareness and ability of teachers to use ICT and carry out flexible and diverse online and offline teaching; helping teachers to master the tools and skills for online teaching and student interaction; tutoring and answering questions; and organizing representatives from regions and schools to share experiences and exchange ideas about common problems arising in teaching and learning.

FIGURE 3 | SCHOOL CLOSURE AND REOPENING DURING COVID-19 OUTBREAK



The Home-school Collaboration Platform provided guidance on parental support, lectures on how to ensure the physical and psychological health of students, and advice on how schools and families can cooperate to improve learning.

It also offered massive online learning resources, including course learning and e-textbooks. According to MoE statistics in early May, the number of visits to the platform reached 2 billion<sup>60</sup>.

The People's Education Press<sup>61</sup> provided open and free access to e-textbooks and all digital teaching resources for primary and secondary students. Huge amounts of public and private online and TV-based educational programming and resources were also made available by 27 provincial and municipal education authorities, schools and private educational organizations to better cater for students' learning needs. These included web-based classroom instruction for teachers. A variety of communication tools and AI-driven (Artificial Intelligence) apps also offered free access to teachers and learners and complemented the public online learning courses (See Table 5). All of these resources allowed access via computer, mobile phones and tablets. In remote areas without access to internet or computers, students kept learning through TV channels and home visits by teachers. Free printed learning materials were prepared and posted to support their education as discussed in Chapter 3.

The education authorities organized a series of training activities to help teachers through demonstration and experience sharing and video lesson development, led by excellent master teachers from model schools at the district level. Trained teachers learned to adopt MOOC and SPOC, film classes, livestreaming classes, online Q&A and other methods. They also used multiple online teaching platforms to improve and innovate teaching models. Different types of online classes were provided to meet the demands of age groups based on their learning habits and characteristics.

**TABLE 5 | EXAMPLES OF MAIN EDUCATION PLATFORMS AND TOOLS**

TYPES OF PLATFORMS AND TOOLS	NAME OF PLATFORMS AND TOOLS
Teaching and learning platforms	NCCP; Wuhaneduyun, UMU, Xinkaoyun, Zhixue, Xuexi, Seewoo, Chaoxing; Little Blackboard; etc
Communication tools	DingTalk, Wechat, QQ, etc
AI-driven apps	Tencent Classroom, Yuanfudao, ClassIn, etc
Online Survey Tools	Wenjuanxing

## ECCE and disadvantaged groups

It is difficult to reach ECCE children through online teaching as they were too young to study independently, and MoE prohibited online teaching for them. However, videos of games and interactive activities, guidance and protocols, and relevant supporting materials were shared with parents through WeChat and QQ chat groups. Regular video and audio meetings were organized with parents to keep close contact with the children and monitor their status.

As mentioned above, on average, households with access to internet and a personal computer is around 47.4 per cent and 46.7 per cent respectively in China. The situation will be worse for vulnerable groups in rural and remote areas. Large numbers of students had to use smart phones to learn online<sup>62</sup> when there was no access to a computer. Smart phones were an alternative to support children from lower social-economic conditions, and those in remote areas without access to computers or broadband internet.

One survey conducted in Pingliang, Gansu province, in January 2020 found that 76 per cent of more than 100,000 respondents, mainly primary and secondary students, used mobile phones for online learning. While 24 per cent had computers or an iPad. Around 5 per cent were not able to access online learning because the equipment/smartphones were too outdated, or there was no space left to run learning apps<sup>63</sup>. The remaining 5 per cent watched TV channels when there was no access to internet.

In addition, students without access to online learning or their parents could go to school and collect free textbooks and learning packages, or ask the school to courier the materials to them. Special initiatives were taken to include all children in learning, including migrants, the disabled, and other vulnerable groups. Take-away packages were posted to these out-of-reach children. Many regions and cities utilized this measure, including Beijing, Chongqing, Taiyuan and Hangzhou. The postage and courier costs were covered by school public expenditures.

MoE data also showed that 95 private education organizations and companies voluntarily provided free access to their products, commercial platforms, and services for teachers and students in Hubei province, or nationwide. These supplemented the resources and learning platform offered by the National Network Cloud-platform for Educational Resources and Public Service.

Regular problem-based trainings were organized by MoE and distance-education platform companies to better equip teachers with the right skills to deliver remote learning,

and for head teachers to better cope with the crisis. These efforts contributed to sustain the education continuity, and guarantee access to learning and participation.

### Safe operations

As the first step to contain COVID-19, MoE repeatedly postponed the start dates of the new semester across the country. They also continuously issued notices to comprehensively deploy and coordinate the prevention and control of the epidemic in the education system. A working mechanism engaging MoE, the National Health Commission, provincial and local education authorities, schools and communities was established to develop relevant policies, protocols and responses to sudden outbreaks of COVID-19. The initiative aimed to reduce the negative impact of the virus on children and students as much as possible, especially the vulnerable. It was followed by specific action plans of reporting, quarantine and lockdowns with clearly divided roles and responsibilities.

Practical and effective measures were taken by schools to mitigate the health risks of this crisis. A class-based daily reporting system was established online through WeChat or QQ groups to report and monitor the health status of individual students. At the same time, schools were working hard to check and improve WASH facilities in schools to prepare for school reopening.

Apart from the facilities, handwashing habits and methods were also crucial for safe-school operations. Although there was a lack of nationally representative data, some regional

surveys found that residents have low rates of washing hands correctly. During COVID-19, videos and training materials were developed jointly by MoE and UNICEF to launch safe school campaigns, and guide students and parents. This was to vigorously promote hand-washing and disease-prevention knowledge, cultivate correct hand-washing habits, and strengthen interventions in hand-washing behaviours in schools, especially for those in rural and remote areas. MoE also developed instructions for schools on staggered classes, daily temperature monitoring, mask wearing, social distancing, etc., so they could prepare for reopening.

### Community participation

Communities played an important role in protecting teachers and students and addressing the crisis. The government organized all the communities to take a unified response through the resident's committees (one in each community).

In China, 4 million community workers were working tirelessly in 650,000 urban and rural communities<sup>64</sup> to monitor the epidemic, measure temperatures, investigate movement of citizens/migrant workers, stand guard, publicize policies, give out protocols and guidance, and watch for the first pass of epidemic prevention and control.

In more than 20 provinces, measures have successively been implemented to achieve closed-community management. In particular, property management companies followed the guidance of resident's committees to strictly implement access management, and reduce



the risk of epidemic spread caused by the movement of people. Community workers and volunteers also worked hand-in-hand to lay down good foundations and prepare for the safe operation of schools for reopening.

Furthermore, communities worked with the Ministry of Civil Affairs (MCA) to identify poor families, assess their needs, and report to the MCA for assistance – especially for those affected by COVID-19.

## Health and well-being

UNICEF identified several potential negative consequences for children and adolescents in the analysis of the COVID-19 pandemic, including the increased risk of child abuse and exposure to violence. As a UNICEF report notes: “We know from previous health emergencies that children are at heightened risk of exploitation, violence and abuse when schools are closed and social services are interrupted<sup>65</sup>.”

In China, the government and MoE considered the impact and risks relating to children’s health and well-being during the school closures. A special column called ‘Mental Health Education for Epidemic Prevention’ was opened on the NNCP platform to provide psychological guidance and support for teachers, parents and students. Online

trainings were organized by education authorities for educators to identify and intervene properly. Guidance and protocols were also provided to parents through parent committees and parent schools. Hotlines were operated at school level for easy access to students.

In order to protect the eyesight of children and reduce their time surfing the internet, China Education Television Channel 4 (CETV) broadcasted the recorded lessons through TV for all grades, considering the learning content for high-stake students in Grade 9 and Grade 12. It covered all provinces, especially in remote rural areas, where the network signal was weak or there was no cable TV.

Provincial and municipal governments also worked together to guarantee time for physical exercise, and reduce the negative impact of electronic devices on students’ eyesight. For instance, Wuhan organized an expert team to develop work plans, protocols, online courses, and counselling on vision protection. A myopia prevention system and a public service network were also established at municipal, district and school levels. A survey covering 502,000 primary and secondary students was conducted to follow-up the status of student vision. As a result, the overall myopia rate in Wuhan was 4 per cent lower than the average myopia rate in nine other provinces, despite Wuhan having the longest school closures<sup>66</sup>.



## Finances

Between February and June 2020, all enterprises enrolled in China's Social Security Schemes were exempt from making employer contributions to pension, unemployment, and work-related injury insurance policies. For instance, this was the case in Hubei province. For other provinces and cities, micro, small, and medium-sized enterprises (SMEs) are exempt from making these contributions. Additionally, large enterprises may reduce employer contributions to pension, unemployment, and work-related injury insurance schemes by 50 per cent.

- As part of a general guidance to provinces, China is encouraging the use of unemployment insurance funds to provide wages and job subsidies to enterprises, particularly for SMEs. The amount varies by locality, but for example in Nanjing, it has been 100 yuan (approximately \$15.54) per worker, per day.
- Unemployment social assistance for up to 6 months was provided for the unemployed who were not eligible for unemployment social insurance benefits. This increased social assistance to families in difficulties.
- One-time cash assistance of 3,000 yuan (approximately \$466) was transferred to the retained migrant population in Wuhan.

The latest government policy directive (6 March, 2020) instructed local administrations to extend coverage of dibao, China's social safety net programme. This included coverage to families whose members are unable to work due to a severe disability or illness, and entitled to a minimum subsidized living allowance, and temporary assistance programmes in the urban and rural areas. They also simplified the application and approval process and increased the benefit level to cover the families who were affected by the epidemic (both directly through infection and indirectly through economic impacts). Examples are available for different provinces (information collected by World Bank Group):

- In Hubei province, 500 yuan (approximately \$78) for urban dibao recipients and 300 yuan (approximately \$47) for rural dibao recipients were transferred as provisional living allowance subsidies. Temporary assistance (emergency help in nature) supported more than 13,000 people with cash transfers of 30 million yuan (approximately \$4.66 million), and provided temporary resettlement for more than 6,000 people in 69 sites;
- In Chongqing, a transfer of twice the monthly dibao amount was introduced to some recipients if they were infected as temporary assistance; and

- In Shenzhen, the amount of cash transfer as temporary assistance could range between two and 18 times the local dibao threshold, based on the individual recipient's situation.

MoE also took the needs of vulnerable groups into consideration and directed the provincial and municipal education departments to offer them free high-quality education resources, as well as subsidies on ICT equipment and internet to ensure the overall epidemic prevention and control progress and their education development. Some examples of the financial aid provided to the vulnerable children in remote areas include:

- The Nanjing Municipal Education Bureau in Jiangsu province purchased 435 tablets for students in small rural schools;
- Changshan County, Zhejiang province sent televisions to students of poor families;
- Guangdong province offered internet traffic packs for 300,000 students;
- Peking University donated computers, mobile phones and other network mobile terminals for students with financial difficulties;
- Sichuan University offered online teaching communication grants to students with financial difficulties in accordance with the 200 yuan (approximately \$31) per person rate<sup>67</sup>.
- 806 teachers paired with 3,667 students from poor families in Feidong County, Anhui province to provide individual support<sup>68</sup>.

International organizations also supported China's efforts to combat the adverse impact of COVID-19. For example, UNICEF contributed around \$5,431,000 to respond to COVID-19, with more than \$1 million focused on supporting the education sector.

## Education system

Transitioning to online learning at scale is a very difficult and highly complex undertaking for education systems, even in the best of circumstances. China faced the same dilemma to sustain education continuity.

The system has played an effective role in mitigating the virus on campus and ensuring uninterrupted learning. It cross-coordinated with relevant ministries and departments to work out the educational response plans and implement DCUL together. For example, it provided a consolidated one-stop-shop for learning resources and platforms for access to learning opportunities by children. The bandwidth was increased to create a stable and conducive environment for online classes working in collaboration with the MIIT.

Protocols and trainings were developed and delivered to guide local education authorities, schools, teachers, parents and learners. Efforts were also made to promote public-private partnership, which helped strengthen the systematic response.

MoE also worked with international development partners including UNICEF, UNESCO, World Bank, and Asian Development Bank to learn from international experience on how to alleviate the impact of COVID-19 and respond adequately. UNICEF, in partnership with MoE and the East China Normal University, launched an online ICT training programme for rural teachers. A tool kit for national replication is being developed to respond to the skills gap that rural teachers are generally facing. UNICEF also collaborated with MoE and other partners to develop and disseminate digital lessons on Social and Emotional Learning (SEL) and for pre-schools children.

## Phase 2 - Part of the reopening process (April to June 2020)

As the domestic epidemic situation gradually improved, schools in different provinces set the dates for starting the semester and reopening by age groups. Thirty-one provinces in China planned semester starts through staggered reopening. This began with the graduating grades in junior and senior secondary schools, then moved on to other grades at secondary schools, primary schools, colleges and universities, and lastly kindergartens (Table 6).

Within about two months after the outbreak of COVID-19, 280 million Chinese students were learning through online classes. Many planned to return to school or went back to school and complete the semester on time. By the end of June, 202 million (75 per cent) of students successfully returned as schools reopened.

### Access to and participation in learning

China used a hybrid approach, combining a mix of in-person and remote learning upon school reopening to guarantee and improve access to, and participation in, learning.

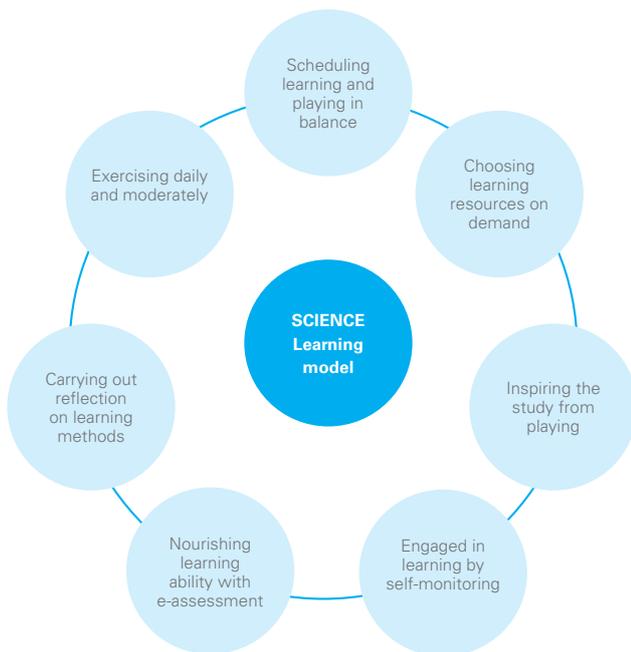
Teachers and students gradually adapted themselves to online teaching and learning. A number of complementary high and low-tech learning platforms were mobilized in a flexible manner to provide access to as many children as possible. Attention was paid to reach more vulnerable groups and meet their needs. The focus shifted from coverage to quality and effectiveness of online teaching and learning, while ensuring education continuity. However, there were skill gaps among teachers using online platforms and tools effectively when trying to meet the individual needs of their own students.

Furthermore, MoE developed a number of protocols in order to provide students with systematic guidance, and help students maximize self-learning opportunities. For example, MoE worked with UNICEF and developed the handbook 'Guidance on Active Learning at Home During Educational Disruption: Promoting Student's Self-regulation Skills During COVID-19 Outbreak' in Phase 1, and rolled out in Phase 2. The manuals proposed the SCIENCE learning model (Figure 4), which equipped teachers and students with targeted and practical advice to help students develop

TABLE 6 | SCHOOL REOPENING PLANS<sup>69</sup>

TYPES OF PLATFORMS AND TOOLS	PROVINCE	REOPENING STRATEGY
March to April 2020	Qinghai, Ningxia, Yunnan, Shanxi, Guizhou, Xinjiang, Inner Mongolia, Tibet, Shaanxi	Staggered School Reopening by phases: a) Graduating grades at lower and higher secondary school (Grade 9 and 12);
April to May 2020	Sichuan, Gansu, Hainan, Zhejiang, Shandong, Anhui, Fujian, Jiangxi, Shandong, Hunan, Guangxi, Guangdong, Chongqing, Hebei, Beijing (Grade 12 and Grade 9 only), etc	b) Other grades at secondary schools (Grade 7 to 8 and Grade 10 to 11); c) Grade 4 to 6 at the primary schools;
May to June 2020	Hubei, Heilongjiang	d) Grade 1 to 3 at the primary schools;
September 2020	Schools at all stages in all provinces	e) Colleges and universities; and f) Kindergartens

FIGURE 4 | SCIENCE LEARNING MODEL



healthy and regular living habits, and independent and efficient learning skills. It also provided good guidance for students' self-improvement and future development.

Transitioning from school closures to reopening, MoE planned to assess the learning outcomes from teaching and learning during school closures, and assess potential learning losses when schools reopened. As a result, decisions could be made about whether remedial actions should be taken. It was found:

- The best students in offline learning tend to perform better in online learning;
- Younger learners experienced more difficulties in online learning compared to older ones; and
- Remote teaching and learning was likely to widen the gap between high-achieving and under-performing students, as well as between students from different family backgrounds.

International data showed that much debate and discussion was carried out on how much students learned via online learning. The conclusion: vulnerable groups would feel a longer-term impact of online learning.

Presently, there is no official data available on the quality of online teaching in China provided by MoE. However, the UNICEF, UNESCO and the World Bank joint-survey data<sup>70</sup> showed that globally, online learning platforms were rated

as either very (36 per cent) or fairly (58 per cent) effective, particularly among high and upper-middle income countries, whereby none of the high-income and only 6 per cent of upper-middle income countries rated online learning as ineffective. TV was rated as 'very effective', while radio and take-home packages as 'do not know'. MoE decided not to repeat the curriculum missed during school closures, and this decision appears to be supported by the above evidence.

Although there were many challenges for students learning at home, it also provided a good opportunity for them to improve their independent learning skills, practice self-protection, and cultivate their self-supervision ability, which are crucial for their future development and growth. Protocols, guidance, and audio and video lectures were provided to develop these particular skills. For example, Jinniu district formulated the Independent Learning Manual for primary, junior and senior secondary students. Independent reading and exercises were offered to students so they could practice the skills.

### Safe operations

Schools took a series of measures to guarantee safety in schools and prepare for reopening, including:

- Daily monitoring of individual temperature and health QR code<sup>71</sup>;
- Well-established communication mechanism among teachers, parents and students;
- Distancing measure for classrooms, dining halls, dormitories, etc.;
- Strengthening school cleaning and disinfection, as well as the cleaning of air-conditioning systems;
- Allocating adequate school doctors and health teachers;
- Accessible single-sex washing facilities with adequate disinfection material storage; and
- Offering trainings for the emergency response work teams and carrying out emergency drills.

In China, systematic preparations and measures were taken to make sure that schools were safe to reopen including access to hand hygiene, clean drinking water and safe sanitation. An effective collaboration mechanism was established among schools, hospitals, communities, and disease control agencies. In addition, plans on prevention and control and emergency were developed. Drills were undertaken regularly to prepare the staff for possible infections.

To minimize the risk of contagion, efforts on safe operation started early in June 2020 to prepare for full school reopening in the Autumn semester from September. The General Office of the National Health Commission and the General Office of the Ministry of Education jointly issued the 'Technical Plan for the Prevention and Control of COVID-19 in autumn and winter in Higher Schools, Primary and Secondary Schools, and Nurseries' in August, and updated it in accordance with the situation in schools and communities. With phased and staggered reopening spanning about one month, all schools reopened and operated on the right track in September.

### Community participations

Communities continued to closely watch the movement of community residents and checking body temperature. They cooperated closely with schools to mitigate possible infection and guarantee a safe living environment in preparation for school-reopening. With the number of infected cases decreasing and under better control, the restriction measures gradually relaxed. Private educational companies and organizations expanded free service and access to their products for students and teachers, who were still in lockdown. Especially for those located in Wuhan and Hubei province.

### Health and well-being

The government listened to children's and teachers' opinions on how to reopen schools in a better way<sup>72</sup>. Protocols were developed to further support children's health and well-being. MoE worked with UNESCO and developed the 'Personal Data and Privacy Protection in Online Learning' guide<sup>73</sup>.

Psychological guidance and interventions were offered for children in the face of COVID-19. More efforts were made to strengthen the construction of mental health education network resources by selecting and recommending high-quality thematic resources and videos from Shanghai, Hangzhou and other places. For instance, videos like 'How to Stay Calm in the Face of the Epidemic', 'Actively Respond to Exam Anxiety', and 'Communication Between Schools and Student Families' provide advice on emotional adjustment, family communication, career planning, etc.

Online trainings and guidance were sent to parents through schools and committees to help them pay attention to their children's physical and mental health. In addition, MoE collaborated with other departments to make visits to struggling children and kids in need, and offer psychological interventions<sup>74</sup>.



## Finances

China backed the economic recovery by delivering a stimulation plan, which has resulted in signs of a burgeoning resumption of work. It also indicated the effectiveness of China's epidemic prevention and pro-growth policies to boost production and domestic consumption<sup>75</sup>. For instance, higher fiscal spending, tax relief and cuts in lending rates and banks' reserve requirements were implemented to revive the economy and support employment. Travel restrictions were lifted across the nation. A set of comprehensive approval procedures were developed and applied for employees' return-to-work. In the education sector, a number of supportive policies for ensuring education continuity were issued by MoE, including fee reduction, exemptions of tuition, one-time subsidies, and special allowances for children in poverty. Not to mention the usual TEOS and dibao assistance for children with financial difficulties in remote and rural areas.

## Education system

MoE updated the guidance and protocols on school reopening in joint efforts with the Ministry of Health and the NDPC. Specific advice was offered to the schools at different levels so that they could progress from staggered to full reopening.

To ensure examinees were not disadvantaged for high school and university entrance exams, MoE decided to prioritize the reopening of these groups of students, and postpone their high-stake exams. This was the first time entrance exams into university had been delayed in China since 1978.

## Phase 3 - With schools reopened (1 September, 2020)

The COVID-19 prevention and control situation evolved positively. By the end of August, the large-scale spread of the epidemic had been prevented, and the full resumption of production achieved remarkable results. There were no new cases in 31 provinces for more than 15 days. However, there were still outbreaks of a few infected cases and small-size resurgences, and the international situation on COVID-19 was still serious.

## Teaching and learning

During Phase 3, efforts were made to enhance the quality of online lessons, upgrading them from an emergency option to take their place as part of a strengthened plan for teaching and learning. DCUL was implemented in the Spring semester to support education continuity. At the end of the semester, 75 per cent of students returned to campus without infection.

MoE summarized the successful experience and lessons learned in combating COVID-19<sup>76</sup> and school reopening, which helped prepare schools for full reopening. However, the digital divide, the skill gaps of teachers and the lack of specific data on equal access to online learning of students made it difficult to conduct further analysis. On 9 July, 2020, MoE announced that schools would return to full capacity from 1 September, 2020<sup>77</sup>. Through top-down and bottom-up efforts and collaboration with relevant ministries and departments at different levels, China reopened schools in all provinces and autonomous regions in September. Systemwide efforts were also made to find out the learning loss and provide targeted support to those students in need<sup>78</sup>.

Pupils started the new school year on 1 September, 2020, except for Xinjiang Uygur Autonomous Region, which started a couple of days later. Though online teaching and learning had high participation rates in the early days of the pandemic, there was a drop in the short term when students moved from home-based learning to classroom-based learning, and when in-person teaching and learning was restored. However, it is expected that the use of digital learning tools will grow over the long term. Students, teachers and parents saw the benefits of online learning, which provided more choices and flexibility not only in terms of access but also for course content. Educators were able to use more interactive methods supported by online tools to engage and communicate with their students. The government has also seen the value of online learning and its potential to complement regular face-to-face teaching. It could also be an effective initiative to promote equitable education.

In the meanwhile, more attention has been given to vigorously strengthening online teaching and learning, better integrate online and offline education, promote independent learning, share high-quality education resource with schools in rural areas, and improve teaching quality. The following measures were taken to achieve these objectives and consolidate the outcomes of DCUL:

- More than 4,000 online courses and resources were developed by master teachers and curriculum development teams from high-achieving schools in developed areas, which covered all subjects and grades in the primary and secondary schools for the Autumn semester. High-quality education resources were recommended by integrating diversified teaching resources for wider use in the nation, especially for rural areas;
- Psychological education trainings were added to the NTPP so as to strengthen mental-health support for students;
- Online and offline workshops were organized to summarize and disseminate the successful experience and lessons learned from different provinces and regions. Advocacy was conducted to further develop high-quality teaching and learning platforms for the use and selection of teachers and students. A three-year action plan for education resource construction in primary and junior secondary schools has also been developed;
- High-quality online lessons and resources were selected with regards to different subjects or topics. Free access to these resources continued to be offered through the NNCP platform and Air Classroom of China Education TV station for all schools;
- MoE promoted the Internet+ education initiative by constructing more high-quality education resource banks, disseminating blended teaching and learning, and increasing investment in ICT equipment and internet access;
- MoE has been investigating and collecting ideas on how to strengthen the construction and application of education resources for primary and junior secondary schools, which will further sustain the outcomes of the DCUL programme;
- MoE instructed China Education TV Station to deploy live satellite reception equipment for nearly 12,000 classrooms in all teaching sites in 52 impoverished counties. These places may find it difficult to access the internet, but TV channels were fine. The cloud interactive TV live classroom model will be applied to enable Beijing's master teachers to interact with teachers and students in the 52 counties. TV-virtual classrooms would help these counties to effectively improve the quality of education;
- MoE has identified 90 experimental areas to pilot innovative ICT-based New Teaching and Learning Models based on Teaching Reform and the Application

of Information Technology' programme. They are actively exploring the paths and methods to integrate online and offline teaching, vigorously promote online education and teaching reform, and play a good role model and leading part in education innovation and upgrading; and

- Global MOOC Alliance has been established to promote the reform on blended education. It is intended to contribute and share the successful experience of online teaching in China more widely.

### Safe operations

A set of well-targeted control strategies to contain infected cases effectively was updated and implemented when schools fully reopened. It guided schools on how to fully reopen safely. Up until the time of writing, no single case had been reported as in-school transmission. Restrictions were relaxed step by step. However, the country is still on high alert, with fears of imported cases and a second wave of domestic infections in the winter.

In response to the possible risks of transmission, MoE worked with the Chinese Center for Disease Control and Prevention (China CDC) to prepare schools. All were required to take initiatives and prevent the outbreak of COVID-19 by improving emergency plans, implementing preventive comprehensive disinfection treatment, and strengthening emergency drills. Continuous efforts were also undertaken to further improve health education, effectively guide teachers and students as well as parents to implement the requirements of epidemic prevention and control, enhance personal awareness of protection, and develop health habits and lifestyles (such as correct hand-washing methods and the 'one-metre line' social distancing measure<sup>79</sup>).

At the school level, lessons were being held on a staggered schedule with mandatory mask wearing and social distancing. Pupils would have their temperatures taken on arrival at school or classroom gates. Anyone who travelled must show that they had a 'green' code on an app that calculated their risk before being allowed back to class. Free flu vaccines were offered and recommended to students and teachers in primary and secondary schools, as well as kindergartens<sup>80</sup>. Schools were fully implementing the updated version of the epidemic prevention and control technology programme; an emergency response mechanism was established and implemented to ensure its effective operation.

## Community participations

Stepping into Phase 3, communities resumed their normal scope of work and stopped monitoring the movement and temperature of residents at the gates of each community. However, they kept alert for any possible spikes in new cases. They were prepared reactivate and respond as they had earlier in the year to effectively curb the spread of COVID-19.

## Health and well-being

MoE paid close attention to the health and well-being of students after the school reopening. Primary and secondary schools continued to strengthen support to students' mental health in four aspects. First, schools made good use of the psychological resources at national, local and school levels to organize a variety of face-to-face activities – including lectures, class meetings, team activities, etc., and carry out counselling for those in need. Second, private in-depth conversations were conducted with individual students to assess their psychological status and possible problems in a timely manner. The third aspect was to improve the reporting system on mental health so as to follow-up with students and help in time. In particular, special attention and support was provided to help those with learning difficulties to keep up with the learning progress, and relieve pressure and anxiety. The fourth was to organize a series of cultural, sports, art and outdoor activities and guide students to exercise more, and get used to school life as soon as possible<sup>81</sup>. In addition, the home-school cooperation was further strengthened to establish a long-term working mechanism and model for psychological health among schools, communities, families and medical institutions.

MoE also analysed the impact of online classes on eyesight and factors contributing to myopia. Work plans and measures were developed to guide students and schools in preventing myopia, such as limiting the learning time of online lessons to no more than two hours for primary kids, and three hours for junior secondary students. In addition, it's recommended to take frequent breaks, adjust the height of tables, chairs and light, and adopt good eye habits.

Furthermore, nutritious lunches, subsidies and other measures were taken to ensure the well-being for disadvantaged groups. In particular, MoE developed initiatives to reduce dropout rates during school closures and reopening.

With the joint efforts of MoE and China Central Television (CCTV), a TV programme called 'First Lesson of New Semester' was broadcast nationally on CCTV 1 on the evening of 1 September. Health-care workers responding to the epidemic, scientists and engineers who achieved great results during COVID-19, and representatives for young people were invited as guests to present knowledge of COVID-19 prevention, and to share their stories.

## Finances

China's economic recovery picked up steam in the third quarter of 2020 as activities normalized amid effective control of the virus, and the government's sweeping efforts to stimulate demand and consumption<sup>82</sup>.

The country is confident of sustaining this momentum. Data from the National Bureau of Statistics (NBS) showed that GDP expanded 4.9 per cent year-on-year this quarter, faster than the 3.2 per cent per cent growth seen in the second quarter. The government also resumed its financial assistance programmes for children in need. Besides the ordinary education spending, the government provided earmarked funding to curb and prevent COVID-19, and strengthen online education resources.

## Opportunities

COVID-19 is the biggest public health crisis in recent times. It brought challenges, but also stimulated innovation, capacity building of staff, system upgrades, and more equitable sharing of resources in the education sector. It encouraged China to consider new education models, including the roles of teachers and students, while providing safe and flexible ways to take exams and assess students. Inequity issues exposed by COVID-19 are attracting more attention and are resolved quicker than before (for example, the distribution of educational resources and the gap in provision). Going forward, the country is considering how to develop more individualized teaching and learning plans and models by drawing on renowned master teachers nationwide. With the pandemic experience, actions are being taken by all relevant stakeholders.

# 03

## Thematic deep dive: Community-based education



While teachers and students had to find ways to adapt themselves to new models of teaching and learning, the government also confronted challenges to implement distance education effectively.

This section outlines the challenges China faced in implementing the DCUL initiative to sustain the education continuity, and mitigate learning losses during the COVID-19 pandemic.

### 3.1. The challenge

China is no stranger to epidemics. For example, it has recently experienced SARS and avian influenza A(H7N9). However, none of their scale, burden on the public health system, and impact on the education sector are comparable to COVID-19.

As discussed above, the Chinese Government initiated several strategies to contain the virus. As one of them, MoE decided to stop all face-to-face teaching in classrooms and turn to distance education. Teachers struggled with how to develop new teaching plans, engage students via camera, and mark student's work remotely. Pupils had to spend more time to preview and review independently as the length for an online lesson was shortened. Parents needed to create an effective learning environment at home, keep in contact with teachers, and monitor children's use of electronic devices to learn – all while keeping an eye on their physical and mental health.

While teachers and students had to find ways to adapt themselves to new models of teaching and learning, the government also confronted challenges to implement distance education effectively. Particularly problematic issues included the following:

- How to provide equitable learning access for about 200 million primary and secondary students during long school closures, especially children in rural and remote areas?
- How to provide diversified high-quality online learning packages to meet the needs of different groups? How to improve the teaching function of existing online education platforms?
- How to balance the teaching plan for model schools in developed areas, as well as the lagged-behind schools in remote areas?
- How to ensure examinees were not disadvantaged for high school and university-entrance exams?

### 3.2. The response

The mission of all education systems is the same; that is, to overcome the learning crisis, minimize the negative impact of the outbreak on learning, and utilize this experience to rebuild better.

The DCUL initiative, launched on 27 February, 2020 as the main response to ensure the continuity of education, offered free online education for students in primary and secondary schools, colleges and universities. Children in early childhood were also covered but in a slightly more informal way, as discussed in subsection Roles in DCUL. Public and private educational enterprises and international development partners also played important parts in rolling out this initiative.

This deep dive into the key elements of the DCUL initiative and three case studies present a good picture of the practice of large-scale nationwide distance education, as well as in-depth analysis of its implementation in central, eastern and western China. This section reviews literature, technical documents and news from national and international websites from the Chinese Government and international organizations – including those in Chinese. Reports from interviews with stakeholders from Wuhan present how DCUL is implemented under the most challenging conditions. It builds on Chapter Two, and takes a closer look at DCUL based on the findings discussed above.

## Roles in DCUL

### Education system

MoE integrated relevant resources at the national, provincial and school levels and provided a wide variety of high-quality online teaching and learning resources to ensure the delivery of the DCUL initiative.

The Leading Group Office was established in MoE to respond to COVID-19. They issued two important notices to guide education bureaus and schools, shown as below.

1. ‘Notice on Providing Information-based Support for Online Education and Teaching (6 February 2020)’ to support the DCUL implementation. The notice deployed efforts to improve network support conditions, enhance platform service capacity, and draw on social resources<sup>83</sup>.
2. ‘Notice on the Work Arrangements of DCUL While Postponing the Start of Semester for Primary and Secondary Schools (12 February 2020)’ jointly issued by MoE and MIIT. It focused on organizing relevant enterprises to effectively provide technical and operational support for the NNCP. The enterprises provided more than 7,000 servers, 90T bandwidth, and other resources to support more than 422 million students to learn online<sup>84</sup>.

The National Network of Cloud-based Classrooms was mobilized by MoE to provide free access to students on 17 February, 2020. The platform was supported by curriculum resources, which won awards at the ministry level while absorbing other high-quality online teaching resources.

Apart from the internal efforts, MoE also worked with UNESCO and issued two guidance booklets to provide advice on facilitating the implementation of DCUL initiative for teachers, students and parents:

1. Handbook on Facilitating Flexible Learning During Educational Disruption (March 2020)<sup>85</sup>
2. Guidance on Active Learning at Home during Educational Disruption: Promoting Student’s Self-regulation Skills During COVID-19 Outbreak (2020)<sup>86</sup>

In consideration of the differences between rural and urban schools, as well as the schools in eastern and middle-western China, MoE advocated for regional communication and cooperation in implementing DCUL, following the principle of mobilizing high-quality resources to provide more equitable access for comprehensive coverage of students.

### Internet access to support the DCUL initiative

China’s fibre coverage was 61.2 per cent pre-pandemic. It was quickly increased to 67 per cent to support online teaching and learning through DCUL initiatives by June 2020, as shown in the 46th China Statistical Report on Internet Development. It found that rural users only account for 28.2 per cent, and the increase of rural internet users is slower than that of urban users. Children in rural areas, where there is no fibre coverage, were able to watch TV educational programmes, or use smart phones for free access to online learning and DCUL resources. The 4G network coverage for mobile phones has exceeded 98 per cent of the national population, with a fixed broadband home penetration rate of 91.8 per cent<sup>87</sup> as of the start of DCUL policy.

TABLE 7 | INTERNET DEVELOPMENT IN CHINA

INTERNET DEVELOPMENT INDICATORS	BY JUNE 2019	BY MARCH 2020	BY JUNE 2020
Number of internet users	854 million	904 million*	940 million
Coverage of fixed line internet	61.2%	64.5%	67%
Number of mobile internet users	847 million	897 million	NA
Proportion of internet users using mobile phones	99.1%	99.3%	NA

\*Rural users 255 million, 28.2% of the total

However, it was reported at the beginning of the DCUL launch that some children in rural and remote areas frequently missed online classes due to weak and unstable network signals. In response to these challenges, MoE worked with four state-owned mobile operation companies to initiate an emergency work plan, build new base stations in those remote areas to improve the coverage of network signals, and expand the bandwidth – especially for those highly infected areas with COVID-19.

Discounted or free internet packages were offered for children from poor families or remote areas to cut their financial burden of attending DCUL programmes. On MoE's side, subsidies on fibre or 4G internet access were also provided to children from poor families or remote areas, as discussed in subsection Phase 1: Prior to reopening. These efforts laid down a good foundation of hardware for DCUL to reach the most marginalized children.

## Schools

Schools organized a series of trainings to enhance the awareness and ability of teachers to use ICT, and deliver online teaching so as to ensure its smooth progress during school closures. The topics not only covered teachers' professional development such as ICT skills, online teaching methods, tools and platforms, remote assessment, etc., but also knowledge and skills on COVID-19 prevention<sup>88</sup>.

Taking real conditions into consideration, municipal or school-based guidelines for online teaching and learning were formulated to provide specific advice for teachers, students and parents on the use of the platforms, curriculum schedule, and resources. Online teaching communities for teachers by subject were established to discuss problems and share successful experiences in delivering online teaching. All these efforts helped to better prepare teachers for the implementation of DCUL.

Moreover, schools also focused on establishing the communication mechanisms for teachers to collect feedback during their daily work, and for parents to engage them in school-home interaction and cooperation. WeChat and QQ were two popular apps used by teachers and parents.

As discussed in the previous sections, elite schools coexist with low-performing schools, and there is a big gap between schools in developed eastern China and those in central and western China. To promote more equitable educational development, inter-regional, inter-district, and inter-school collaboration was conducted. For instance, elite schools supported low-performing schools on how to deliver online teaching effectively by sharing their teaching resources, offering online trainings, and organizing regular discussions for teachers and head teachers. The collaboration model helped to expand the coverage of high-quality education resources and promoted education equity.

A case study on inter-regional and inter-school collaboration between Qiantang Primary School in Fuzhou (developed eastern China) and three rural primary schools located in Gansu, Ningxia and Fujian provinces during the pandemic is presented below<sup>89</sup>.

### Peer support to three primary schools in remote areas by one elite school

On 8 February, 2020, Qiantang Primary School organized online training on how to address the main challenges in online teaching for English lessons. It was part of their peer support for 300 teachers from three low-performing primary schools in remote provinces: Dongzhao Primary School in Gansu, Ningxia Yanning Town Central Primary School, and The Party Hope School in Shouning County, Fujian.

The training focused on seven main challenges in online English teaching, while implementing the DCUL initiative. A Q&A session was held after training to answer questions.

Peer support groups between trainers and trainees were formed using WeChat for daily discussions.

## Teachers

**"It's easier to observe students' performance and remind them to concentrate during face-to-face teaching, but it's much harder to balance the learning status of each student in the cloud-based class with live instruction. In addition, online teaching requires new skills on a variety of software. Some older teachers may need to spend more time getting familiar with them in advance," said Ms. Jiang, a Grade 12 Chinese teacher in Beijing<sup>90</sup>.**

Teachers were at the heart of DCUL implementation. To start, they attended online school tutorials or trainings offered by the platform companies, and tried to equip themselves with the required ICT and digital skills. It was quite challenging for many, as this was not their usual way of teaching. Especially for elder teachers and those in remote areas, who had very limited knowledge about education technology and remote teaching and learning.

A teaching platform was then selected by individual teachers or schools from a variety of free public and private platforms, available in accordance with the learning foundation and characteristics. The choice was also made depending on whether filmed classes or live-streaming classes were adopted. DingTalk and Tencent Classroom were two of the most popular platforms.

To develop new plans, subject-based virtual group preparation at and beyond the school level was organized among teachers, as online teaching requires different structures and approaches to deliver instruction. The focus also shifted to support a student self-study model,

followed by collecting good education resources as the learning content. It was found that group preparation helped to reduce the workload, share good practices and solve problems.

**“I’ve learned a lot about the skills to design questions for student assignment list through online group teaching plan preparation,” said Ms. Zou Yan, a K3 primary teacher<sup>91</sup>.**

With all this preparation completed, teachers sent weekly curriculum plans and learning resource packages to students and parents, including for example guidance on learning methods, and supplementary learning and reading materials. They organized students to watch micro-lessons/video lessons, monitored their progress, allocated assignments, marked homework, and provided individual feedback. For most teachers, roles changed from facilitating learning in classroom to coaching, so as to ensure the effectiveness of home learning. Regular online Q&A sessions were also scheduled to answer enquiries. For children having no access to online learning platforms/materials in remote areas, teachers made visits to their home and brought or posted printed learning materials to them.

For some subjects that did not have a live recording session scheduled on the curriculum timetable, teachers arranged the corresponding reading and writing tasks, provided filmed videos or audios and other assignments based on the characteristics of the subjects and teaching content.

Efforts were also made to explore how to best support student’s learning with high-quality curriculum and supplementary materials. The same choice was made after a period of experimenting in different provinces; that is, organizing excellent master teachers to record/film lessons as the starting point for teaching, but allowing different regions and schools to integrate with their own strategies. These initiatives helped most teachers to take time out and provide more targeted guidance for students to study at home.

While online lessons were prepared and delivered, the leading teachers worked hard to establish a communication mechanism with parents and students. They needed to get in touch with 100 per cent of the families and make sure they had everything they needed for their children to learn. Otherwise, DCUL was not going to work. This system ensured that every student was informed of DCUL arrangements, engaged in the learning, and was offered psychological support if needed. Teachers strived hard to ensure that no one was left out of DCUL.

### Learners

**“There is a large number of primary and secondary students in China. As the local situation, economic conditions, students’ age characteristics of different grade levels, physical and mental development, and cognitive status are all different, it’s suggested that the DCUL initiative adheres to the unified deployment by the provincial and local governments. The provinces and schools are allowed to implement the policy according to the local conditions,” said Mr. Lu Yugang, Director of the Department of Basic Education, Ministry of Education, China<sup>92</sup>.**

Students were the main participants and beneficiaries of the DCUL initiative. The government, teachers and society all collaborated together to pave the way for implementing the initiative and sustaining education continuity. Students accessed education resources through different tools in accordance with their own economic and geographic conditions (Table 8).

TABLE 8 | DCUL TOOLS FOR STUDENTS

GROUPS OF STUDENTS	TOOLS FOR DISTANCE LEARNING
Students with computers and internet access	Use Computer or Tablet to Access Online Learning
Students with no computers	Use Mobile Phone to Learn Online and Access Learning Materials
Students in rural and remote areas with no or limited access to internet	China Education TV Station and Take-home Materials

Financial support and equipment were provided to children in remote areas and poor families to ensure their access to online learning, which varied from province to province. Some areas offered subsidies on internet traffic or donated free tablets, mobile phones and TVs. Some provided individual guidance through peer support, as discussed in Roles in DCUL above.

Students at different education stages attended the online lessons in the specified platforms as discussed in the following session. A learning schedule and packages including math, Chinese, music, PE, and arts were sent to the students on Mondays through WeChat, email or QQ. At the end of each week, students were required to prepare a summary of their learning achievement via PowerPoint, photos, reports, etc., and submit to their teachers for comments.

In general, students followed individualized plans for their daily study under the guidance of teachers. The content ranged from subject learning, physical exercise, after-school activities (singing, painting, manual works, calligraphy, etc.), living skills (cooking, cleaning, etc.) and so on. The overall learning style focused more on self-learning and left a bigger space for students' individual development.

Students attending high-stake exams were given priority in the schedule, provision of lessons and guidance. It was a little difficult to involve ECCE students in online teaching, as they were too young for distance education. And it was prohibited to conduct online teaching to them by MoE. However, online interactive games and activities, as well as home-school guidance, were sent to parents to keep younger children learning as well.

### Parents

Parental engagement is a critical piece of the DCUL initiative. It is a juggling act between parenting and learning facilitation. On one hand, parents provided all the logistical support to make it possible for kids to attend the online learning. That included protecting children from the virus, exchanging messages with teachers and taking care of kids. Parents were a bridge between the school and teachers with children in all ways. On the other hand, they had to act as facilitators for supporting and monitoring children's learning. The availability and quality of parental support by middle and high-income families was often higher than that of low-income families, which had an impact on the learning outcomes.

Parents from low-income families often lacked the capacity to support their children in terms of digital skills, academic background and knowledge, etc. Some schools were struggling with this challenge, and some on realising the issue offered lots of guidance to strengthen parents' capacity, such as running an online parent school. However, capacity building is not a one-time input, but requires long-term assistance.

DCUL created an additional challenge for working parents as well. They experienced mounting levels of stress as they grappled with choices about their work-life balance, the future of their children's education, and how to keep their families safe from the virus.

### Learning resources and packages by government

High-quality learning resources paved the way to smooth DCUL implementation<sup>93</sup>.

- **Primary and secondary students:** Free access to the NNCP platform and The National Network Cloud Classroom (NNCC) since 17 February, 2020, which supported students to learn online for more than 20 billion cumulative person-times during the DCUL implementation<sup>94</sup>. NNCP offered teaching resources developed and recorded by more than 470 outstanding teachers from 18 schools, including Tsinghua University Primary School, Zhonguancun Third Primary School in Beijing, and Beijing 101 Middle School<sup>95</sup>. It provided e-textbooks from Grades 1 to 12.
- **Children in remote rural areas with no cable television:** China Education Television Channel 4 (the broadcast schedule is announced in advance). Due to the limited time available on television channels, the broadcast content mainly focused on the primary level, considering the needs of middle and high schools, especially high-stake students who take the entrance examination for high schools and universities. It aired for 14 hours a day, covering households in remote rural areas, with weak signals or no access to cable television. The channel covered an additional 295 million people<sup>96</sup>.
- **Open online learning platforms** in some developed provinces (Beijing, Shanghai, Zhejiang, Sichuan) and elite primary and secondary schools. To enrich learning resources, some provincial education departments and well-known primary and secondary schools offered access free-of-charge to the national open online learning platform or online schools.
- **College and university students:** 24,000 free courses on 22 online course platforms for online teaching in universities. These courses were carefully selected based on quality, which were developed by master teachers. The courses were offered in a variety of forms including MOOC, SPOC, virtual simulation lab courses, and more. The content of learning resources and packages covered all 12 disciplines of undergraduate and 18 major categories of vocational colleges.
- **Other resources:** Free electronic versions of the teaching materials.

**TABLE 9 | SUMMARY OF NATIONAL ONLINE RESOURCES PROVIDED BY GOVERNMENT<sup>97</sup>**

NO.	NAME OF PLATFORM	COVERAGE	RESOURCES
1	NNCP	Primary to high school (Grades 1 to 12)	800 Micro-classes, including modules on epidemic prevention education, character education, curriculum learning and 10 other sectors
2	NNCC	Primary to high school (Grades 1 to 12)	E-textbooks from grades 1 to 12
3	A number of platforms	Higher education	22 Online course platforms, including about 24,000 courses such as MOOC, SPOC and virtual simulation lab courses

The government also prepared platforms and conducted various stress tests to implement DCUL smoothly. It aimed to expand the platform sufficiently to avoid congestion when users logged in at the same time on the same courses.

In addition, primary and secondary students needed to interact with teachers during the learning processes. Many schools and teachers tended to choose platforms that offered functions such as live streaming and group chat videos. Many office apps have specifically expanded online teaching capabilities to serve for this purpose<sup>98</sup>.

### Adapted curriculum

**“DCUL does neither simply mean online classes nor just learning following the school curriculum. It refers to more broad learning as long as the content and approaches help students to grow and progress<sup>99</sup>.”**

DCUL called for an adapted curriculum based on the different levels of learning of students. In the overall design, it considered how to balance length of time, structure of distance learning, and content. The structure followed a hybrid teaching and learning model that was composed of short and refined micro-classes, independent learning offline, and supplementary network or traditional resources.

It was advocated to develop layered and personalized curriculum schedules for DCUL by MoE. Apart from the main courses (Chinese, math, English, etc.), music, PE, arts, etc. were an integrated part of the schedule. An example of a curriculum schedule of primary and senior secondary schools are presented below.

**TABLE 10 | EXAMPLE OF CURRICULUM SCHEDULE FOR GRADE 12 IN BEIJING**

NO./ DATE.	MONDAY 13 APRIL	TUESDAY 14 APRIL	WEDNESDAY 15 APRIL	THURSDAY 16 APRIL	FRIDAY 17 APRIL
1	<b>Home education</b> Organising time at home; home education-harmonious family relationships require children's stance	<b>Ethics and Laws</b> (State-compiled education) the pledge of civil rights	<b>Chinese</b> Social theatre	<b>History</b> The establishment of the People's Republic of China (Beijing edition) exploring asia (session 2)	<b>Chinese</b> Social theatre
2	<b>Science education</b> Activities; how big is the pouring rain? – Natural disasters in China	<b>Geography</b> (Beijing edition) Exploring Asia (Session 1); Differences in Chinese geography	<b>English</b> Unit 1: Lesson 1 Schools of the Future	<b>Geography</b> Difference in Chinese geography	<b>English</b> U1 Lesson 1 Schools of the Future 2
3	<b>Aesthetics education;</b> Chinese folk songs	<b>PE and Health</b> Eye exercise; radio gymnastics for secondary schools students	<b>Geography</b> Analysis of the direction of the geography Chinese high school entry examination and the academic level examination		

TABLE 11 | AN EXAMPLE OF CURRICULUM SCHEDULE OFFERED BY THE CETV 4

CETV4 class schedule (17th Feb - 21st Feb)					
Airtime	Mon	Tue	Wed	Thu	Fri
<b>Primary school</b>					
<b>Live classroom grade 1</b>					
8:00- 8:30	Chinese 1	Maths 1	Chinese 2	Maths 2	Chinese 3
8:30- 8:40	Pandemic prevention mini-class: What to do in public places?				
<b>Live classroom grade 2</b>					
8:40- 9:10	Maths 1	Chinese 1	Maths 2	Chinese 2	Chinese 3
9:10 – 9:20	Pandemic prevention mini-class: public health – Our responsibilities				
<b>Live classroom grade 3</b>					
9:20 – 9:50	English 1	Chinese 1	Maths 1	Chinese 2	Maths 2
9:50 – 10:00	Pandemic prevention mini-class: Washing hands correctly in 7 steps				
<b>Live classroom grade 4</b>					
10:00 – 10:30	Chinese 1	Maths 1	English 1	Chinese 2	Maths 2
10:30 – 10:40	Pandemic Prevention mini-class: public health – our responsibilities				
<b>Live classroom grade 5</b>					
10:40 – 11:10	Maths 2	English 1	Chinese 1	Maths 2	Chinese 2
11:10 – 11:20	Pandemic mini-class: What to do in public places?				
<b>Live classroom 6</b>					
11:20 – 11:50	Chinese 1	Maths 1	Chinese 2	Maths 2	English 1
11:50 – 12:00	Pandemic prevention mini-class: Washing hands correctly in 7 steps				
12:00 – 13: 00	Cartoons + children’s drama; The safety secret service + Storytelling by sister kaname				
<b>Secondary school</b>					
13:00 – 13:00	Chinese: Reading	Maths: Rational numbers	English: Test	Physics: Speed	Chinese: Reading
<b>High school</b>					
13:30 – 14:00	Reading; Chinese	Reading; Chinese	Reading; Chinese	Reading; Chinese	Reading; Chinese
<b>Live classroom: key knowledge for university entrance examination</b>					
14:00 – 14:50	Physics	Chinese	Politics	Chinese	Biology
14:50 – 15:00	Pandemic prevention mini-class: General knowledge				
<b>Live classroom: key knowledge for university entrance examination</b>					
15:00 – 15:50	Chemistry	English	History	English	Physics
15:50 – 16:00	Pandemic prevention mini-class: General knowledge				
<b>Live classroom: key knowledge for university entrance examination</b>					
16:00 – 16:50	Biology	Math	Geography	Maths	Chemistry
16:50 – 17:00	Pandemic prevention mini-class: General knowledge; Protect your family				
17:00 – 18:00	Children’s drama; The leaf girl; Little mermaid; Journey to the west 2; Shiliang ma; King lear				
18:00 – 19:00	Joining together: Theme-based class meeting; Humanities history class: Everlasting heroes; Jirong Huang; Wenjia Zou; Shaoyi Hu; Yang Luo				
<b>Live classroom: key knowledge for university entrance examination;</b>					
19:00 – 19:50	Biology	Maths	Geography	Maths	Chemistry
19:50 – 20:00	Pandemic prevention mini-class: General knowledge				
<b>Live classroom: key knowledge for university entrance examination</b>					
20:00 – 20:50	Biology	Maths	Geography	Maths	Chemistry
20:50 – 21:00	Pandemic prevention mini-class: General knowledge				
<b>Live classroom: key knowledge for university entrance examination</b>					
21:00 – 21:50	Biology	Maths	Geography	Maths	Chemistry
21:50 – 22:00	Pandemic prevention mini-class: General knowledge; Protect your family				

Detailed requirements for online education were also introduced. Zhejiang Provincial Education Department issued guidance, requiring high-quality online teaching.

**TABLE 12 | AN EXAMPLE OF TEACHING TIME FOR DCUL IN ZHEJIANG<sup>100</sup>**

EDUCATION STAGE	LENGTH OF A LESSON	COVERAGE
Primary education	20 minutes	1 hour (Lower grades) 2 hours (Higher grades)
Junior secondary education	30 minutes	4 hours
Senior secondary education	30 minutes	5 hours

Another example of the curriculum schedule set for the senior grades in primary schools is shown in Table 13, which is a bit heavier for the lower grades, but is also a mixture of subject studies, general courses and activities.

**TABLE 13 | AN EXAMPLE OF DAILY CURRICULUM SCHEDULE FOR SENIOR GRADES IN PRIMARY SCHOOLS<sup>101</sup>**

<b>Labour and communication (1 hour)</b>	<ul style="list-style-type: none"> <li>One hour for each subject (15-minute filmed class + 30-minute self-study)</li> <li>Subject A</li> <li>Subject B</li> <li>Subject C</li> </ul>
<b>Exercise (1 hour)</b>	<ul style="list-style-type: none"> <li>Indoor exercise</li> <li>Rope skipping</li> <li>Etc.</li> </ul>
<b>Activities of individual interest (1 hour)</b>	<ul style="list-style-type: none"> <li>Painting</li> <li>Singing</li> <li>Paper-cutting</li> <li>Etc.</li> </ul>
<b>Labour and communication (1 hour)</b>	<ul style="list-style-type: none"> <li>Help with housework</li> <li>Family communication</li> </ul>

To integrate with life and local conditions, some interesting elements were absorbed to develop an adapted curriculum. For example, Wulian County Experimental Primary School includes housework in the daily schedule of students in Rizhao, Shandong province. Hand-made works, house cleaning, and planting fruit and vegetables have become the homework of primary and secondary school students in Chenzhou, Hunan province. In Jiaozuo, Henan province, learning to cook a dish every week was a compulsory course for all students<sup>102</sup>.

The adapted curriculum also paid attention to the popularization of epidemic prevention knowledge, strengthened education on home economics public security and mental health, and encouraged students to exercise and carry out extracurricular reading.

### Monitoring and evaluation

Remote inspection and evaluations continued to be carried out at different levels, monitoring the progress of DCUL during the pandemic. The practice varied from one province to the other. In some, school and district-level inspectors worked with teachers to prepare lessons and guide them while monitoring the progress of DCUL implementation. In other provinces, regular online workshops were organized to share experiences and lessons learned.

MoE also conducted online surveys to ask for feedback on DCUL from students, teachers and schools. Some other surveys were also conducted at the provincial, municipal, district and school levels to assess the learning outcomes of DCUL, and inform future teaching. However, these data and findings were all for educational administration purposes, and are not available for public to access.

### Public-private partnership

Educational organizations and companies voluntarily offered free access to their services and products for students and teachers, especially in places where they were heavily affected by COVID-19. MoE data showed that 95 enterprises offered choices of online teaching and learning service and resources (Table 14). They enriched the high-quality educational resources and service available and expanded the coverage of distance learning for students and teachers.

TABLE 14 | PARTICIPATION OF PRIVATE ENTERPRISES IN SUPPORTING UNDISRUPTED LEARNING IN CHINA<sup>103</sup>

NO	TYPES OF ENTERPRISES	FREE SERVICE OR ACCESS PROVIDED	ENTERPRISES
1	<b>Educational organizations and companies</b>	<ul style="list-style-type: none"> <li>Free access to their private courses and resources to the whole country, especially to children in Hubei and Wuhan</li> <li>Provided donations or medical supplies</li> <li>Free live broadcast platforms and technical support for primary and secondary schools in Hubei</li> <li>Free online small-class teaching skills training for public schools across the country</li> <li>Free online professional psychological counselling for the psychological needs of primary and secondary school teachers and parents</li> <li>Supervised student achievement through free curriculum resources, live broadcast function, data analysis system, AI intelligent question bank and other functions</li> <li>Free online learning platform and online classrooms for schools and offline training institutions in need</li> </ul>	艾上AI艾宾浩斯智能教育 (Ebbinghaus Intelligence Education) 新东方 (New Oriental) 好未来 (TAL Education Group) 跟谁学 (GSX Techedu) 101教育 (101 Education) 爱学习集团 (Aixuexi Group) 精锐教育 (JING RUI Education) 无忧英语 (51Talk)
2	<b>Companies providing online education solutions and educational technology services</b>	<ul style="list-style-type: none"> <li>Free access to online live broadcast platforms and remote teaching technology services to help schools and teaching and training institutions translate offline courses to online, ensuring teaching activities and teaching progress</li> <li>Free access to live teaching</li> <li>Free access to their own courses and resources</li> <li>Open online teaching platforms and online teaching tools for all Grade 12 education practitioners and educational institutions for free</li> <li>Free operation service support and free guidance for partners in 58 cities across the country</li> <li>Free 100-party cloud video conferences to government agencies, medical institutions, educational institutions, and enterprises across China to ensure epidemic command of government agencies, remote consultations of medical institutions, online teaching in educational institutions, and home office work for enterprises</li> <li>Provided a full set of free cloud classroom online teaching, live broadcast solutions, and recording system technical support services to teachers and students</li> <li>Supported analysis of online-class data</li> </ul>	翼鸥教育 (ClassIn) 轻轻教育 (Changingedu) 小鱼易连 (xylink) 希沃 (Seewo) 北京四中网校 (Beijing No. 4 Middle School Online Classes) 保利威 (Polyv)
3	<b>Internet high-tech enterprises</b>	<ul style="list-style-type: none"> <li>Free support for Hubei schools to develop independent online teaching services</li> <li>Used cloud video technology to provide a free one-stop online teaching live broadcast and on-demand platform for large and small classes for public schools and educational institutions in Hubei</li> <li>Free access to online courses taught by excellent subject teachers selected by Wuhan Academy of Educational Science on their platforms</li> <li>Free distance teaching services to primary and secondary schools in all regions of the country until the school resumes classes normally, including online lesson preparation, online learning, online subject assignments and online Q&amp;A tutoring and other remote teaching functions</li> <li>Offered intelligent teaching assistants to teachers with personal teaching assistants for lesson preparation and remote teaching</li> <li>Smart air classroom (online live teaching system) used the internet as a medium to construct online classrooms and realize remote teaching</li> <li>Synchronized the homework after class, and feedback the students' practice situation in real time through academic situation analysis</li> <li>Used cloud video technology to provide a free one-stop online teaching live broadcast and on-demand platform for large and small-sized classes public schools and educational institutions in Hubei</li> </ul>	优酷 (Youku) 钉钉 (Ding Talk) 腾讯教育 (Tencent Education) 华为云 (Huawei Cloud) 字节跳动 (ByteDance) 科大讯飞 (iFlytek) 京东云 (JD Cloud) 百度云智学校 (Baidu Yunzhi Academy)

## DCUL implementation

To take a close look at how DCUL has been implemented in different regions, one city was selected to present their DCUL practice and experience from the Eastern, Central and Western China respectively.

### DCUL implementation in Eastern China - Beijing

After MoE decided to implement DCUL, students, teachers and educational authorities jointly took quick action to start it in eastern China, including Beijing.

**“Beijing is the capital of China with a population of 21 million people. There are 3,640 schools, including 941 primary schools and 765 secondary schools. There are 4 million students supported by 248,239 full-time teachers. The retention rate of compulsory education exceeded 99 per cent in 2019<sup>104</sup>.”**

Like other municipalities and regions, Beijing rigorously followed MoE instructions on the DCUL initiative. Teachers, parents and students worked together to form communication channels through instant messaging tools. Guidance was offered with online teacher trainings organized. Everyone was informed of the national learning resources and teaching reforms, while hard copy textbooks were posted to students to avoid face-to-face contact.

Apart from the national resources and platforms, Beijing Municipal Education Commission (BMEC) organized the best master teachers to film municipal online classes, and prepare resources which better met the needs of Beijing students.

Overall, BMEC offered an all-media learning solution for students. Beijing Digital School was open to offer municipal resources for all K1 to Grade 12 students, which could be accessed through TV, computer, tablet, and mobile phones. In addition, they could be accessed repeatedly and even downloaded. Hardcopy and electronic versions of the supplementary materials were provided free of cost for students. The all-media solution considered full coverage, teaching quality, network congestion, and eyesight protection.

Great importance has been attached to the quality and effectiveness of DCUL and therefore the learning outcomes. BMEC suggested teachers should guide students to try to learn independently offline. On the first

day of DCUL implementation, many schools provided students with games and project-based micro-courses to develop self-learning abilities, and to get familiar with online learning.

**“By no means, DCUL won’t be a set of online lessons to spoon-feed students and keeping them watching the screen for a whole day. We encourage teachers and leading teachers<sup>105</sup> to select learning resources adapted to the learning characteristics of their own students and provide guidance needed over the learning content,” said Li Wei, a spokesman for BMEC<sup>106</sup>.**

Teachers in Beijing Chaoyang Experimental Primary School used the winter break to record micro-course videos for students, which were basically about seven minutes – the longest of which was no more than 10 minutes. Students learned the basic principles and knowledge via video first. Students then independently studied further offline, while teachers were available to support online and to answer questions.

The primary school affiliated to Peking University also provided students with a ‘learning package’ together with guidance on learning arrangements, annexes, resources and comprehensive activities. The Learning Arrangements presented the learning content in weekly units. The materials included in annex documents were to help children complete the relevant learning list, task list, instruction sheet, etc., and the content in Resources was to help children complete the relevant learning audio, video, etc. Teachers guided students to study independently in the form of micro-classes, study sheets and task lists.

Sixteen municipal model head teachers and teachers were organized by BMEC to answer questions for teachers, parents and students on the BMEC WeChat account. In particular, they provided individual advice for students about how to select lessons and resources<sup>107</sup>.

TABLE 15 | DCUL IMPLEMENTATION PERIOD BY EDUCATION STAGE

NO.	EDUCATION STAGE	GRADES	DCUL IMPLEMENTATION PERIODS*
1	Primary school	Grade 1 to 3	Feb. 17 to Early July (One semester)
		Grade 4 to 5	Feb. 17 to June 7;
		Grade 6	Feb. 17 to May 31;
2	Junior secondary	Grade 7 to 8	Feb. 17 to May 31;
		Grade 9	Feb.17 to May 10; Mid-June to Mid-July;
3	Senior secondary	Grade 10 to 11	February 17 to May 31;
		Grade 11 to 12	February 17 to April 27;
4	Higher education	All	February 17 to Early July (One semester)
5	ECCE	All	February 17 to Early July (One semester)

Online inspections were carried out to monitor the quality of DCUL and provided support for teachers. In Haidian District for instance, school-based inspectors joined the online class and provided individual feedback. Teaching and research staff from Beijing Teacher Training School (BTTs) and Beijing Academy of Educational Science (BAES) collected good practice of online teaching videos or teaching plans for each module to share with teachers regularly. Sometimes, they would even act as role models to deliver a lesson, record it, and share with teachers.



Located in central China, Wuhan is representative of a quickly developing city where about 11.2 million people live.

BAES conducted a survey at the end of the Spring Semester among all the primary and secondary schools (over 160) in Haidian District (a top-performing district not only in Beijing, but nationally). The survey focused on the teaching and learning progress and mental health by conducting interviews with school administrators, teachers and students. Detailed analysis has been made for each subject to inform the teaching plan for the new semester, which started in September, together with solutions discussed and agreed to with each individual school. Another survey was carried out for the high-stake students in Grade 9 and Grade 12. An in-depth analysis was conducted for each individual student to identify the strength and areas for improvement as a result of DCUL. Data and findings from the surveys were submitted to the district and municipal education authorities for further planning and development. Unfortunately, this data is not open to the public, or it could have provided a guide to other countries on how to continuously improve remote learning systems.

Furthermore, BTTS organized master teachers to continue to record video lessons for the Autumn Semester as a sort of forward preparation for a possible spike of COVID-19 after reopening. The best practice and valuable teaching and learning resources from DCUL was sustained to provide more flexible and individual options on learning.

### DCUL implementation in Central China - Wuhan

Located in central China, Wuhan is representative of a quickly developing city where about 11.2 million people live. With nearly 50 per cent of the total infected cases in China<sup>108</sup>, Wuhan experienced the strictest lockdown and longest school closures in China – from February to early

July in 2020. Under these very challenging conditions, Wuhan managed to successfully sustain education continuity for about 1 million primary and secondary students through DCUL, without leaving anyone out. Table 16 presents Wuhan Education Profile.

TABLE 16 | PROFILE OF WUHAN EDUCATION<sup>109</sup>

EDUCATION STAGES	NUMBER OF SCHOOLS	NUMBER OF STUDENTS	NUMBER OF FULL-TIME TEACHERS
ECCE	1,794	357,311	25,778
Primary and Junior secondary	909	853,665	54,042
Senior secondary	219	210,370	18,003
Universities	110	1,275,640	60,034
Special education	9	3,088	255
<b>In Total</b>	<b>3,041</b>	<b>2,700,074</b>	<b>158,112</b>

“Wuhan launched the DCUL through Wuhan Education Cloud Platform to respond to COVID-19 as soon as the schools closed. DCUL mitigated the negative impacts and transformed the threats into opportunities for exploration on how to integrate ICT with classroom teaching in depth”, said Mr. Peng Xiaohou, Deputy Divisional Chief of Basic Education, Wuhan Education Bureau.

DCUL has been implemented and led in a systemwide way by the Wuhan Education Bureau (WEB). They started with Grade 9 and Grade 12 on 1 February, 2020, then rolled it out to all other grades on 10 February<sup>110</sup>. A series of online

teaching and learning implementation plans were first issued to provide policy guidance for administrators and teachers in schools. More specific DCUL strategies were developed for all primary and junior secondary schools in each of the fifteen districts, while individual action plans were formulated for every senior high school<sup>111</sup>.

A working mechanism was established to adjust the policies and plans regularly at the municipal level. Efforts were made to establish a classroom inspection system and identify an education information and technology chief in each school to optimize online teaching. Wuhan also guided 12,000 students who did not have access to the internet by watching the China Education Television and Hubei Provincial TV station<sup>112</sup>.

Rich education resources were offered to facilitate DCUL. Apart from national and provincial resources, district-based resources were developed and shared on the Wuhan Education Cloud Platform (WECP, <https://res.wuhaneduyun.cn>). Master teachers from the elite schools of each district were organized to record video lessons, not only for the use of all teachers in the district, but also across other districts. More tailor-made school-based resources were gradually developed to meet the needs of students as school closures continued and teachers became used to online teaching. An example of school-based resource development is presented in Box 1.

**Box 1:** Online Dual-master Escorting Mechanism (ODEM) was a valuable experience to develop high-quality lessons in many schools; that is, a pedagogical expert and an educational technology expert to guide and support teachers in online curriculum development. In West Street Primary School, 105 teachers have been chosen to deliver live-streaming demonstration lessons for Hanyang District since 10 February, 2020. As a result, 230 excellent lessons were developed to benefit teachers and students in the district, for which ODEM played an important role.

All these lessons were prepared following four steps: lesson planning by individual teachers, group preparation in subject groups by grade, school-master team review, and district-level teaching and research team review. In addition, school-based master teams comprised of master teachers and subject leaders paired with selected teachers to provide individual follow-up support throughout the whole preparation and delivery processes. By doing so, it formulated a strong supporting system with teachers acting as 'anchors' with dual masters escorting.

Teaching plans, e-textbooks, micro-teaching, supporting materials, test item database, cartoon, and course wares of all subjects and grades from Grade 1 to Grade 12 were provided on the cloud platform. Guidance was also offered for ECCE teachers and parents.

Besides the compulsory courses, some schools also developed abundant school-based micro-teaching lessons on a variety of topics as optional courses to enrich their education resources<sup>113</sup>. For example, West Street Primary School of Hanyang District developed over 500 micro-teaching lessons including cooking, handmade works, drawing, reading and so on<sup>114</sup>. What's more, plenty of online activities were organized, such as video class meetings, flag-raising ceremonies, birthday parties and graduation ceremonies, which enhanced the interactions among students and teachers.

**“The Wuhan Education Bureau has always valued teacher training. A five-level hierarchical teacher training system has been established prior to the pandemic, which functioned well to contribute to the implementation of DCUL,” said Mr. Peng Kaiyun, Director of Wuhan Continuing Education Centre for Primary and Secondary Principals and Teachers (WCEC).**

To guarantee the smooth implementation of DCUL, online layered trainings were organized on WECP by WEB to cover all teachers in Wuhan. The focus included online teaching, selection and design of teaching content, methods of live-streaming lessons, ICT skills, and management of online teaching. Among them, ICT skills were regarded as a priority for the 2020 ECCE, primary and secondary teachers on which over 7,500 teachers received the training. Instructors with frontline teaching experience were selected to provide trainings on what and how to teach and assess for teachers in nine subjects. Furthermore, Q&A sessions on the technical issues of DCUL, operation manuals and videos were offered to provide more guidance for teachers.

On the basis of training needs assessment, teacher trainings were flexibly designed with an online backup plan depending on how COVID-19 evolved. Monitoring and evaluation measures were taken to adjust trainings if needed, and ensure the quality. In total, forty-one teacher-training programmes were delivered during the pandemic, of which thirty-four were online trainings<sup>115</sup>. The trainings helped to address the challenges in the use and application of WECP and other platforms, and promoted the construction of air classroom curriculum, classroom efficiency and teacher professional development.

WEB mobilized different parties to provide psychological support for teachers, students and parents. Wuhan Continuing Education Centre for Primary and Secondary Principals and Teachers organized general trainings on mental health protection, while special trainings on health and epidemic prevention were delivered for the health teachers in schools. About 2.1 million teachers, students and parents attended these trainings<sup>116</sup>. In the meantime, Wuhan Institute of Education and Science (WIES) provided different sorts of counselling and psychological support by stages<sup>117</sup>.

**Stage 1:** January 30 to March 2020. Emergency counselling was offered to respond to the COVID-19 crisis. More than 20 psychological experts and master teachers were organized to develop 16 videos on different topics, and share with all districts.

**Stage 2:** March to June 2020. A series of lessons were released online to maintain mental health during school closures, including 68 video lessons via WECP. In total, 4,120 lessons were delivered to support the learning of 1.88 million students. Three hundred and twelve full-time psychological teachers provided counselling service through online or hotlines. Typical issues raised included the tense family relationship between children and parents, worries on the shift of learning modalities, and home-study and academic challenges. Recommendations on professional psychological helplines at the national, provincial and municipal levels were also released to the public.

**Stage 3:** 8 April to June 2020. WEB organized experts to develop guidance on self-management of study and life after Wuhan eased the lockdown on 8 April. The guidance was made into three episodes of feature films broadcasted on Wuhan Education TV Station and WECP.

**Stage 4:** September 2020 to present. Efforts focused on the formulation of a two-year work plan to improve the psychological service system, provision of psychological courses, construction of counselling rooms in primary and secondary schools, and development of the standard and implementation examples of psychological safety prevention for primary and secondary school students in Wuhan.

**Box 2:** COVID-19 was a crisis but also an opportunity for education. Zhongjiacun Boarding School in Hanyang District responded promptly to engage students in rich after-class activities and provide psychological support. For instance, Little Brother Ma, one of our leading teachers, insisted on recording videos every day to connect with students and relieve their anxiety. More than 2,000 videos were developed on a variety of topics led by Little Brother Ma. Whisper Mailbox was opened to communicate with students via text messages and emails and offer psychological guidance, which was well received by parents and students. Online home visits were conducted to follow up on the learning difficulties and provide advice for parents. Changchun Street Primary School carried out 11,000 online video home visits as of December 2020, and 99.19 per cent of parents believed that the visits had a clear incentive effect on children<sup>118</sup>. Special attention and care was also paid to the children of medical staff, who were paired with teachers in every class.

**Box 3:** Wujiashan No. 3 Primary School in East and West Lake District was an exemplary school in disadvantaged student care. Designated teachers followed up daily with 13 students, whose parents were medical staff providing support for their learning. Psychological counselling was offered, while records were kept. School administrators and teachers paired with these students to track their learning progress, develop individual supporting strategies and communicate with them through QQ, WeChat, phone calls, and text messages. For students from poor families, the school coordinated with telecom companies to provide free internet access. Teachers contacted communities where disabled children live, and volunteered to supplement living materials for them, including food, drink, clothes etc. Textbooks were posted to those who lived in remote rural areas to supplement their learning through China Education TV station. Changchun Street Primary School initiated individual mentoring for children of 259 medical staff and 229 community volunteers. They also launched morning and night classes for 283 children of both parents going back to work<sup>119</sup>.

During the implementation of DCUL, Wuhan schools provided donations, subsidies and special care to support disadvantaged groups, especially those from poor families, whose parents were medical staff, had lost jobs or were infected.

Taking the additional pressure on students into consideration, there was no system-wide monitoring and evaluation to follow up the quality of distance education in Wuhan during DCUL. However, comprehensive evaluation was conducted at the district and school levels when schools reopened, in order to link online teaching with face-to-face teaching well. Some schools conducted regular online surveys to inform DCUL implementation and make data-based decisions. For example, Changchun Street Primary School designed 15 questionnaires to collect data on learning styles, technical support, difficulties and queries, family needs, etc., from parents, teachers and relevant stakeholders. In total, 45,000 questionnaires were received and analysed to inform management strategies and optimize teaching effect<sup>120</sup>.

In addition to guaranteeing the learning continuity of students, teachers in the communities developed eight types of courses for community members during lockdowns such as mental health, and disease prevention and control, which contributed to their lifelong learning. It added up to 4.78 million person-times of community members who participated in community learning through online and offline channels in 2020<sup>121</sup>.

### DCUL implementation in Western China - Pingliang

The DCUL initiative has also been rolled out in western China, but with more challenges. A case on the DCUL implementation in Pingliang, Gansu (whose GDP ranked near the bottom from thirty-one provinces in 2019) is discussed to provide an example of how DCUL was implemented in the middle and western regions.

Pingliang is a city located in eastern Gansu and has a population of 2.3 million. There were 30,000 teachers and 380,000 students. DCUL was implemented from 17 February to 14 April, 2020 before schools reopened on 15 April. To start with, an online survey was conducted in late January about the learning conditions, tools and methods to prepare for DCUL implementation. More than 100,000 questionnaires were sent out to collect data.

- It was found that 5 per cent of students did not have the right learning conditions for DCUL as their parents' mobile phones were out of date, or lacked storage space

- 76 per cent could only study via mobile phones as only 24 per cent of households had computers or tablets, which showed a big gap between western and eastern China; and
- 88 per cent of students would like to attend live-streaming lessons, while 12 per cent of students wished to study independently. It revealed that students lacked the capacity to learn through projects or independently.

Based on the survey data, three types of distance learning platforms were provided, including TV channels, online learning platform and live-streaming learning platforms. The feedback from users showed that the Master Teacher Classes offered by China Education TV Channel were very popular among rural students; the utilization rate of private learning resources (free during pandemic) was higher than that of the national resource platforms.

It was anticipated by the local education bureau that equity issues might emerge, which could enlarge the gap between urban and rural students, high-performing and lagged-behind children, and increase the number of dropouts. To guarantee the quality and access to DCUL, the education bureau established a platform called Pingliang-Dingtalk Smart Campus (PDSC) in cooperation with Alibaba (one of the biggest internet companies in China). All teachers and students were registered and trained on the platform. At the same time, class groups were set up to train teachers systematically in livestreaming instruction methods, assignment, student attendance, selection of course wares and editorial and application modules. Consequently, DCUL was implemented in an organized and united way in Pingliang.

Inspection and evaluations were conducted every two weeks to inform and monitor the progress by schools in implementing DCUL. A special reading campaign was launched to improve reading, especially for rural students. Large-scale online reading activities with a variety of topics were organized to increase the amount of reading and strengthen students' reading capacity. Four online workshops were organized to share experiences and lessons learned among teachers from different schools.

Measures were also taken to guarantee DCUL coverage for students from poor households. For instance, free internet traffic packages were offered to 2,432 registered students with financial difficulties by the joint effort of government and three network operators. For families that had only one mobile phone but needed to support several children, schools and teachers helped schedule their classes by giving priority to live-streaming classes for elder children, and then played the filmed classes for the younger ones.

### 3.3. Analysing the response

From 17 February to 30 August 2020, DCUL has been put in place to sustain education continuity for the biggest student population in the world. As a national initiative, it swiftly responded to COVID-19 and cushioned the negative impact on the education sector. It aimed at reaching all students, including those in rural and remote areas, children of migrant workers, and children with disabilities. Some surveys on the effect of DCUL showed that the overall satisfaction rate of students is high. In particular, it is higher with students in urban areas than those in rural areas<sup>122</sup>. Just over 77 per cent of students think that it is good to study online during school closures, and 72.9 per cent were satisfied, or very satisfied, with online learning at home. Regarding the effect of home study, 69.4 per cent of students feel 'very satisfied' and 'satisfied', while only 2.9 per cent of students felt 'very dissatisfied' with it. This indicated that better equipment and socio-economic status made the DCUL experience more favourable for urban students than rural ones. As discussed in previous sections, many initiatives were taken to guarantee the achievement of this goal.

The large investments made in ICT infrastructure in recent decades made it possible to implement DCUL, especially in rural and remote areas. The coverage is impressive, with TV channels available to reach children in the most isolated areas. However, TV worked well with video lessons but not live-streaming lessons. It is still difficult for some students to access DCUL in the remote mountainous areas where there were no stable signals. There is still more work to be carried out by the different departments and institutions to bridge such digital divides.

The needs of students in remote and rural areas and from poor families were considered in the provision of the DCUL. A variety of measures were taken to guarantee their access, including providing subsidies, free internet traffic, donation of TVs, mobile phones and tablets, posting hard copies of textbooks and learning materials, and making home visits to support their learning. It is clear that these vulnerable groups were included in the workplan for DCUL by MoE, but there is no disaggregated data available for the access and participation of each disadvantaged group so as to analyse the effect of DCUL in more depth. Crucially, there is very little information about how DCUL was made available for special education needs children.

While very rich public and private online teaching and learning resources at the national, municipal, district and school levels are available and free to everyone, it is challenging for schools and teachers to select the appropriate ones and serve the individual needs of their students. The lower the level the resources were developed for, the more individualized they were. The topics covered in the learning resources are comprehensive, ranging from subject learning and labour education, to individual interest development, and physical exercise, which considered the full development of students as well as their physical and mental health. The quality and relevance of the learning resources and packages available had the biggest impact on effect of DCUL, as the more relevant the resources are, the more effective DCUL implementation is<sup>123</sup>.

There was no systematic official data available to judge the overall learning achievement and losses as a result of DCUL. In general, self-regulation played a critical role in learning outcomes. The results of Gaokao 2020 (university entrance examination) in Haidian District, Beijing showed that students with better self-regulation and motivation also do better in this learning modality than those who lack the skills. The results were the same in Wuhan. The learning model changed to self-study supported by flexible resources while there was less teacher lecturing. Conversely, students with a lack of self-regulation ability learned less during DCUL without the close supervision and facilitation of teachers.

Teachers worked at the front line to facilitate DCUL. They encountered a large number of challenges, including new teaching models, a heavier workload to prepare online teaching plans, a lack of online teaching skills, digital skills and knowledge about various platforms, and psychological support for children. A series of trainings were organized to address these challenges quickly. Elder teachers experienced greater difficulties with their ICT skills, which the education bureaus noticed and took measures to address. Most of the challenges were tackled after some time experimenting and practicing, but a few still require long-term capacity building.

The quality of parental support made a difference on the effect of DCUL. Higher-income families were able to provide better support and learning environment for DCUL learning, while lower-income and rural parents often struggled in terms of digital skills, academic knowledge and psychological backing. Schools tried to strengthen parental support through closer school-family collaboration such as weekly online parent meetings, and providing more guidance via establishing parent schools.

Psychological problems stood out as one of the main challenges for DCUL when students had to study at home for months. Stress in the household, including intense parent-child relationships, generated psychological issues for children. Students were also anxious while being isolated, studying alone and adapting themselves from offline to online and vice versa. The government and education administration departments strived to provide guidance for teachers and parents through trainings, case study videos, lectures, and hotline service, etc.

The cross-department cooperation within the government and the public-private partnership also contributed to the success of DCUL. With this initiative, China built the largest online teaching and learning community globally. To further improve its effect, it requires exploring new models that ensure learning is available everywhere and accessible at all times for all, in the same can-do spirit that led the world's largest online education experiment during the height of the pandemic<sup>124</sup>.



# 04

## Lessons learned



Parental support and psychological problems remained as two of the main challenges.

Key lessons from the pandemic must be translated into actions that enable countries to respond promptly and adequately to the COVID-19 pandemic<sup>125</sup>.

## 4.1. lessons learned

The following lessons were learned through reflection on the DCUL initiative, using literature reviews and interviews with government officials.

Online and TV were used as the main modalities to deliver DCUL. **An integrated implementation plan** would further improve diversity and effectiveness of resources given their respective advantages. As a result, the two platforms could complement each other and reach all children more effectively.

Extensive amounts of resources have been developed to support online teaching and learning. **A more layered resource bank would be helpful** to respond to the needs of different groups in consideration of the regional education development, ICT capacity of teachers, and student learning characteristics and foundation levels. Schools are encouraged to develop localized and school-based resources by drawing on existing materials at all levels.

There are no system-wide instructions on which online teaching platforms should be used. Though schools encouraged teachers to explore and select any one they felt appropriate, it is very difficult for schools to make a choice as these platforms were new to them. For the convenience of teachers, there could have been **a recommended list of platforms** given by the national, provincial or local ICT expert teams for each education stage, together with detailed operation manuals. Trainings could then be provided for those selected platforms agreed to by the teachers.

Master teachers were organized to record video lessons and micro-lessons for free access for all teachers, the aim of which was to reduce the workload of lesson preparation and share high-quality resources to narrow the education gap. These lessons were developed without students, so that they could only be **used to facilitate teaching** instead of replacing the teaching completely.

MoE noticed the heavy workload of online teaching-plan preparation once DCUL started. Teachers were grouped by subject to work together and divide the work. It is important to **differentiate the content** that is appropriate for online teaching and that which is suitable for students' self-study. An overall strategy could be developed to guide the teaching plan preparation.

To improve the effect of DCUL, it is critical to **engage students more actively** in online teaching. Video lessons and micro-lessons were adopted as one type of the main resources, which is lecturing oriented. Note-taking could be used as one of the recommended methods to strengthen the learning for older ones, followed by note sharing and group discussions on the difficult and key knowledge points presented in the lessons. More tailor-made one-to-one interaction and mentoring would also motivate the younger ones to participate actively.

The DCUL called for student-centred pedagogy, curriculum and evaluation reform, which advocated change from traditional teaching approaches to more interactive and blended instruction, a flexible competency-based curriculum and a formative and summative integrated assessment.

Parental support and psychological problems remained as two of the main challenges. Forward planning and training through parent schools and case studies about good practice, especially targeting disadvantaged groups such as children from poor families and remote regions, could support them better.

Education authorities summarized the experience and lessons learned during DCUL implementation when schools reopened. Data were shared internally within districts or municipalities, but there was a lack of public data available on systematic measures, quality issues, learning losses, etc. A more transparent and open data-sharing mechanism during and after DCUL would contribute to develop an informed and resilient response to COVID-19, and future emergencies. The best practice could be distilled for more sustainable development.

## 4.2. Recommendations for increasing resilience to future emergencies and crises

The Chinese education system has withstood the challenges of the pandemic and returned on the right track. MoE, education departments and bureaus, schools and other stakeholders have been summarizing the experience and lessons learned, and using it to inform the development of future work plans in order to increase system resilience. The following recommendations are made based on a number of desk reviews in line with government plans:

### Recommendation 1 - Increase investment to build on existing teaching and learning resources, and strengthen the provision of more localized and tailor-made ones

The quality and relevance of online education resources determines the extent in which they can improve teaching effectiveness, efficiency and learning outcomes. It is recommended that:

- MoE organizes workshops across regions to share and disseminate the good practices and lessons learned from the use of existing resources during DCUL, especially to rural schools;
- MoE organizes special education experts and subject experts to work together and develop audio, video, and other appropriate forms of resources to support the learning of students with disabilities;
- The provincial departments of education (PDE) review the existing resources to make the lists of recommended resources for regions in line with their education development, and guide teachers to choose and make better use of them;
- MoE and PDE improve the diversity of online resources to cover more subjects other than main courses, and better integrate the content with information technology;
- PDE and schools include online resource development as part of the 14th five-year education plans and not only continue to develop video lessons, micro-lessons and other forms of online resources by master teachers – but also listen to the ideas of regular teachers;
- PDE provide trainings for teachers on tools and apps for resource development, and build up incentive mechanisms to encourage more teachers to develop school-based resources on the basis of national and municipal resources;
- MoE and PDE organize expert teams to guide teachers on how to select core knowledge points for resource bank development; and
- MoE and PDE strive to share high-quality online teaching and learning resources by renowned master teachers with rural and remote schools, so as to achieve a more balanced urban and rural educational development.

### Recommendation 2 - Enhance the capacity of teachers in student-centred blended education

Blended education is regarded as the future trend for education development by the government in China. The DCUL experience provided educational policymakers and practitioners in China with a chance to rethink how and when to move forward towards blended education, as well as the challenges lingering ahead. Of them, the key to more student-centred blended education is to build up teachers' capacity in delivering it. It is recommended that:

- MoE and PDE conduct a survey on the main challenges in delivering student-centred blended education, identify the training needs of teachers, and report to MoE;
- PDE develop modular training plans in response to teacher needs, especially in online teaching using more professional online teaching tools, while special attention is paid to elder teachers and new teachers; MoE and PDE organize participatory teacher trainings, together with follow-up support in classroom teaching and include them in the NTTTP, pre-service and in-service teacher trainings;

- MoE develop policies to sustain teachers' positive mindset on the use of ICT, and retain their improved competencies to further integrate educational technology into teaching;
- MoE, PDE and schools carry out curriculum reforms to reflect student-centred teaching strategies and blended education elements;
- PDE and schools update the assessment standards and methods to integrate formative and summative assessments with the focus put on learning outcomes, while adopting flexible forms of valuation, including formative and combined assessment through tests, exercises, tasks, group work, etc.;
- MoE strengthen the institutional development of student-centred blended education practice and provide more policy support to guide PDE and schools;
- Teachers reflect on how to better support students' learning by integrating online and offline teaching and adapt themselves from the traditional role of transferring knowledge to creating, evaluating and promoting knowledge; and
- Schools establish learning communities for teachers to discuss, explore, share good practice and learn from each other.



### Recommendation 3- Cultivate more independent learners to improve learning outcomes and be better prepared for lifelong learning

Independent learning abilities turned out to carry a lot of weight on the effectiveness and learning outcomes of DCUL initiatives. To cultivate capable independent learners, it is recommended that:

- Teachers change the teaching model to be more interactive and student-centred, offer more opportunities for students to think, and explore and practice independently through self-directed reading, data collection, group sharing and feedback;
- Teachers stimulate the learning interest with diversified teaching and learning activities, and cultivate their self-learning habits;
- Teachers and parents establish a democratic, equal, and harmonious learning environment and classroom culture, providing every student with opportunities to present themselves;
- Teachers encourage students to raise questions on the basis of preview, independent thinking, making comments and presentations, etc.;
- Teachers reduce lecturing in the classroom, increase group work to offer students with more self-learning opportunities, improve students' ability in problem solving, expression, and teamwork;
- Teachers and peers provide timely encouragement and assessment, guide students to reflect on their own learning, set up individual learning objectives and gain a sense of achievement;
- Teachers, peers and parents help students to master a variety of learning methods, which work for themselves, so that they are able to use the appropriate method against the need of different types of learning tasks and objectives;
- Schools and families focus on the development of self-regulation, time management and planning in the daily studies, from early grades onwards.

### Recommendation 4- Reduce the digital divide and its impact on education equity for children in remote and rural areas, poor households, and learners with disabilities

Children from low-income families and remote areas tend to have less access to digital devices and the internet, which widened the gap in their learning, participation, and outcomes. It is recommended that:

- MoE prioritize the construction of ICT infrastructure and internet facilities for schools in remote and rural areas, who faced difficulties in implementing the DCUL initiative;
- MoE earmark funding to donate or lend more digital devices to vulnerable students and improve their access to online learning;
- MoE formulate a financial aid plan for the hardest-to-reach children, with subsidies or allowances provided to guarantee their access to online learning resources during post-pandemic periods;
- PDE organize regular trainings for the school faculty on ICT skills and digital device maintenance, so that they are able to support teachers and students in online teaching and learning; and
- MoE work with PDE to equip schools with qualified resource classrooms where appropriate devices, tools and platforms are offered based on the number of learners and types of disabilities.

### Recommendation 5- Strengthen data-informed monitoring and evaluation to formulate policies and plans for school reopening

Evidence-based monitoring and evaluation could guarantee the educational response to achieve its objectives more effectively and support better school reopening. It is recommended that:

- MoE review and collect data on the participation, use of online teaching and learning tools and platforms, outcomes of online learning, feedback on the education resources, finance, health, etc., through the national EMIS system;

- MoE collect data on the coverage of DCUL of hard-to-reach groups and the challenges they face to quickly generate future remedial measures;
- MoE collect disaggregated data on the key aspects of DCUL by gender, age groups, regions, rural and urban, disabilities, household income etc., to formulate more tailored and resilient work plans and promote institutional development. Especially for gender digital divide, school meal availability, data on incidence of violence in the home or peer cyberbullying, etc;
- MoE strengthen the transparency and availability of data for public access and develop an all-involved action to improve response efficiency;
- MoE develop data-informed policies and plans to guide school reopening, and shape the post-COVID-19 new normal; and
- PDE and schools provide feedback on the implementation of data-informed work plans and develop, monitor and evaluate sub-systems at the provincial and school levels.

### Recommendation 6- Review the overall effect of investment in educational technology to improve future construction plans, and support educational development

Educational technology has made a great contribution to ensure the success of the educational response to COVID-19 in China. Taking the DCUL delivery into consideration, it is recommended that:

- MoE and PDE look into educational technology construction in the previous ten years to evaluate their effectiveness;
- MoE and PDE summarize the experience and lessons of applying educational technology for DCUL;
- MoE analyse the needs of educational technology construction in order to promote the development of blended education;
- MoE and PDE develop investment plans and adjust based on evaluation results, DCUL findings and blended education needs, with a special focus to enhance its effectiveness, efficiency and educational equity; and
- MoE accelerate the investment in the educational technology facilities and provide trainings for teachers to strengthen their ICT skills and abilities.

## 4.3. Conclusion

This country case study highlights China's educational response to the COVID-19 pandemic throughout school closures to reopening. Systematic and comprehensive measures have been jointly taken by the government and society to sustain education continuity, contain the spread of the virus, guarantee health and well-being of teachers and students, and provide financial support. Despite the varying durations of school closures across the country, efforts are made to implement the DCUL initiative so as to maximize the coverage of distance education and mitigate learning losses.

A case study on the DCUL implementation in three cities – developed, developing and remote regions respectively – was conducted through literature reviews and stakeholder interviews to take a closer look at China's experience. The study results illustrate how the DCUL initiative successfully reaches out to children including disadvantaged groups, to mitigate the risk of learning gaps during the school closures. Internet and TV are the main channels for DCUL delivery, while free paper-based textbooks and take-home packages were posted to the hardest-to-reach children. Diversified support on digital devices, internet access and traffic, bandwidth, and subsidy is provided to vulnerable groups, especially those from poor families, whose parents are medical staff, migrant workers or were infected. Children with disabilities are also included by voluntary home visits by teachers.

In general, the literature review and case study data showed the DCUL has achieved its goal of inclusiveness; however, the learning experience and outcome of students vary to some extent. For example, children from low-income families are more likely to access DCUL via TV or mobile phones. This likely contributes to a less interactive learning experience and decreased quality. The more independent learners achieve more highly, while the struggling learners need more individual support. For instance, independent and self-regulated learners tend to achieve historically high scores in the 2020 Gaokao – the National College Entrance Examination.

Rich teaching and learning resources are supplied for the DCUL practice. However, there is a difference of quality and relevance existing among regions. In developed areas, the more localized and tailor-made teaching and learning resources are established for teachers and students to cater for their needs.

With the introduction of DCUL, many teachers mastered the skills to conduct synchronous or asynchronous online teaching, use online learning resources and tools, and design and facilitate network or TV-based learning. Most learned how to use communication tools to connect with parents and students. They have been integrating the best practice from online teaching into blended teaching and learning models as all schools reopen. They have also been rethinking their role to innovate new models of learning.

It is clear that the vulnerable groups are at a more disadvantaged position in terms of learning facilities, abilities, environment, parental support, resources, etc. Though extensive support and investments have been provided for them during the crisis, and their access to education is guaranteed, the gap in learning experience, quality and outcomes remained. The distance education has opened a door for them to access high-quality resources to some extent, although this is far from adequate, as the relevance of resources to their learning foundation accounts. It is recommended the government continue to increase the investment and support for vulnerable groups.

The quality and relevance carry the heaviest weight on the DCUL effect. The more relevant resources are, the more effective DCUL is. The research also found that in the more developed regions, more localized resources are created. It is critical to balance the online education resources between developed and remote areas. To do so, it is recommended the government highlight the need to build up the capacity of teachers in remote areas on how to develop localized online curriculum and resources and blended approaches.

Looking ahead, stakeholders in the education sector are reflecting on the DCUL practice to analyse the impact, support recovery from this crisis, and benefit the subsequent work plans. Organized review, summary and sharing of the experiences will better inform local and national responses. It will also contribute to the policy and decision-making for educational reform and development in the short and medium term. In addition to the case study, more in-depth and systematic quantitative and qualitative research might be required to some specific interventions. It is also critical to complement the study with more explorations and researches to ensure equity and quality in the future, based on lessons learned during this period.

# Annex A: Participant list of Wuhan interviews

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<b>Mr. Hanqiang Zhang</b>	Director of the Institute of Basic Education	Wuhan Academy of Educational Science
<b>Mr. Kaiyun Peng</b>	Director of the Continuing Education Centre for Principals and Teachers of Primary and Secondary Schools	
REPRESENTATIVES OF TEACHERS AND PRINCIPALS		
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<b>Ms. Yiping Tao</b>	Vice Principal of Zhongjiacun Boarding School	Hanyang District
<b>Ms. Aijun Sheng</b>	Vice Principal of Wujiashan No.3 Primary School	East-West Lake District
<b>Ms. Hong Yang</b>	Principal of Changchun Street Primary School	Jiangan District

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# China Case Study

Situation Analysis on the Effects  
of and Responses to COVID-19  
on the Education Sector in Asia

This report reviews the impacts of and responses to COVID-19 on education in China, provides reflections on lessons learned so far in China's COVID-19 response, and analyzes capacity gaps for recovery. It explores successful elements of the Government response, issues and challenges faced, and strategies adopted to continue students' learning during school closure. It also looks to the future, in building back better and increasing the resilience of the education system to future shocks.

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