



REDE  
TEMPO  
BRASIL



Boletim do Tempo Presente - ISSN 1981-3384

## Digital Transformation to deal with the pandemic in China: the case of distance education

Ademir Macedo Nascimento<sup>I</sup>

Yupeng Shi<sup>II</sup>

Albaniza Irani Sales<sup>III</sup>

**Abstract:** With the spread of the coronavirus to almost every country on the globe, several types of strategies have been developed to deal with the consequences of the Covid-19 pandemic. In this sense, this research seeks to analyze how the use of information and communication technologies in China helped to mitigate the impacts of the pandemic. Among the findings, it is noted that by combining a broad digital infrastructure in the country with a mobilization of the population to adapt to digital solutions, China has managed to minimize the impacts on education. Thus, as the pandemic reveals that its impacts will be increasingly lasting in our daily lives, it is important to note the paths of digital transformation in China.

**Keywords:** Covid-19; Coronavirus; Distance Education; China; Digital Transformation.

## Transformação Digital para lidar com a pandemia na China: o caso da educação a distância

**Resumo:** Com a disseminação do coronavírus para quase todos os países do mundo, vários tipos de estratégias foram desenvolvidas para lidar com as consequências da pandemia Covid-19. Nesse sentido, esta pesquisa busca analisar como o uso de tecnologias de informação e comunicação na China ajudou a mitigar os impactos da pandemia. Entre os achados, destaca-se que, ao combinar uma ampla infraestrutura digital no país com uma mobilização da população para se adaptar às soluções digitais, a China tem conseguido minimizar os impactos na educação. Assim, como a pandemia revela que seus impactos serão cada vez mais duradouros em nosso cotidiano, é importante observar os caminhos da transformação digital na China.

**Palavras-chave:** Covid-19; Coronavírus; Educação a distância; China; Transformação Digital.

NASCIMENTO, A. M.

SHI, Y.

SALES, A. I.

## Introduction

The rapid spread of the coronavirus around the world created several challenges for governments, making them deal with unusual situations in their daily lives to contain the spread of the virus. Among the measures taken, the circulation restrictions for the population stand out, for example, the measures of social isolation and the suspension of travel<sup>IV</sup>.

In addition to the concern about the disease and its impact on the health system, public managers have also been apprehensive about the slowdown in economic activity, both during and after the pandemic. Such concerns revolve around the increase in unemployment rates, bankruptcy of companies and the strangulation of the production chain in this new scenario<sup>V</sup>.

With the spread of the virus to almost all countries, different strategies have been adopted to deal with its socioeconomic consequences. However, in many cases the actions are recent, which makes it difficult to measure their results, making it necessary to seek initiatives that have a certain maturity since their implementation.

As the first country to show cases of the Coronavirus, China is naturally one of the main places to be analyzed when looking for possible ways to deal with the pandemic that has been plaguing the world. In addition, China was the first country to effectively control the spread internally (World Health Organization [WHO], 2020), while revealing new problems that Western countries may experience in the near future.

The information technologies have gained even more prominence in a scenario in which circulation restrictions have been widely adopted and this study intends to observe their impact. In the case of China, it is noted that the last decade has promoted an intensification of its digital transformation, ranging from messaging applications to exclusively virtual means of payment.

From this context, this study seeks to analyze the extent to which information and communication technology solutions have helped China to deal with this new reality brought by the pandemic situation.

## Theoretical foundation

### Crisis management

Crises and natural disasters often have a catastrophic impact on economic, health and infrastructure systems. When the consequences of such events are serious, urgent and crucial decisions need to be made<sup>VI</sup>. For this, it is necessary to develop contingency plans and planning for crisis management.

Crisis management presents a paradox. On one hand, a very detailed planning of the emergency response must be carried out, but on the other hand, the occasion demands spontaneous actions, thus managers need to innovate, adapt and improvise. A well-designed plan will hardly be able to meet all circumstances arising from the emergency<sup>VII</sup>.

In common situations, the standard planning of a crisis is to assess the characteristics of the risk agent and develop a standard operating procedure. However, when the crisis goes beyond the country's borders, as in the case of the Covid-19 pandemic, the response cannot be static guided, it must change dynamically. An inadequate response in such situations can stem from a disconnection between the procedures established by government agencies (bureaucracy) and the new rules and procedures necessary for those affected<sup>VIII</sup>.

NASCIMENTO, A. M.

SHI, Y.

SALES, A. I.

Crisis management requires much attention to be paid to communication, especially in the information society. An effective response to a crisis situation is directly related to the availability of accurate information in real time. In this way, the information collected needs to be verified and shared with the press<sup>IX</sup>. The management of such information is vital as the government must issue recommendations for protection procedures for the population, and it must also issue communications that restrict contact with infected individuals, through quarantine measures, travel restrictions or isolation of the infected person<sup>X</sup>.

### Epidemics and consequences throughout history

The occurrences of outbreaks and epidemics follow the history of mankind, and their occurrences have generated profound transformations in societies over the centuries. Table 1 summarizes some of the main epidemiological events in the history and some developments of such events for life in society.

**Table 1.** Epidemics throughout history

Epidemic	Contamination mode	Number of deaths	Replies
Black death (1333 - 1351)	Transmitted through the flea of contaminated rats.	50 million	Improvement of hygiene and sanitation conditions in cities.
Cholera (1817 - 1824)	Ingestion of contaminated water and food.	Hundreds of thousands	Improved sanitary conditions and improved personal hygiene habits.
Tuberculosis (1850 - 1950)	Transmitted from person to person via the airways.	1 billion	Research to identify Koch's bacillus and develop antibiotics.
Variola (1896 - 1980)	Transmitted from person to person via the airways.	300 million	Vaccine development.
Spanish flu (1918 - 1919)	It spreads through the air, through droplets of saliva and sneezes	20 million	Personal hygiene, education, and health practices.
Yellow Fever (1960 - 1962)	Transmitting mosquito bite.	30.000	Vaccine development.
Ebola (2013 - 2016)	Contact with animal remains contaminated by the virus.	11.297	Isolation to reduce the spread of the virus and mass testing.

**Sources:** WHO (2020), Oswaldo Cruz Foundation (2020) and Snowden (2019).

More recently, in 2020, the COVID-19 virus spreads, first in China and secondly affecting Europe, North America and other regions of the world. The World Health Organization (WHO) demonstrates in mid-May that the death toll in this COVID-19 pandemic has already surpassed the 350,000 mark.

As the virus spread throughout the world, the containment measures were tightened,

NASCIMENTO, A. M.

SHI, Y.

SALES, A. I.

especially from the Chinese example. Some of the main measures recommended by WHO to reduce the rate of contagion are quarantine, social isolation and closing all non-essential businesses. It is believed that such mechanisms will reduce the rate of contagion, which will dilute the demand for intensive care unit beds, improving the capacity to care for patients.

However, such measures have an immediate effect that is extremely harmful to the countries' economy. According to the forecast of the International Monetary Fund (IMF, 2020), the world GDP should retract up to 6.7% in some regions of the world in 2020.

This adverse effect of the COVID-19 pandemic has led countries to adopt measures to stimulate the economy and social protection, in addition to adopting digital solutions to mitigate the impact on daily activities. In the US the government announced a program to inject US \$ 2 trillion into the economy to support unemployed people and companies (United States of America [USA], 2020), the European Union approved an anti-crisis investment that reaches US \$ 1.08 trillion distributed among credit guarantees for companies and aid for the vulnerable population (European Commission [EC], 2020). In Brazil, the federal government presented a US \$ 28.2 billion program to face the crisis, targeting the most vulnerable population and maintaining jobs<sup>XI</sup>.

## **Methodological procedures**

Aiming to carry out a broad analysis, we searched recent scientific articles that deal with the actions of Covid-19 in China in the last months. However, due to the short time of this situation we also used information brought by media and reports from international organizations, such as the World Health Organization (WHO) and the International Monetary Fund (IMF).

## **China's actions to deal with the socioeconomic consequences of covid-19**

In this section, the main actions taken by China will be presented, seeking to detail the motivations for such actions and how they were implemented.

### **Distance Education**

The academic year 2020 underwent abrupt changes in China in view of the increase in cases of people diagnosed with COVID-19, which initially concentrated in Wuhan but later started to grow in all parts of the country. Therefore, with the advance of the epidemic, the Chinese government decreed the closure of schools on February 17 and started the school year through a set of institutionalized digital platforms.

Thus, the distance learning methodology was applied in order that even at home students would not fail to continue their school life. In China more than 200 million students started to use digital platforms. With the help of Baidu, Alibaba, Huawei and other technology companies, China established its National Platform for Primary and Secondary Schools, which provides free educational programs for students of primary and secondary students. More than 1,400 universities also provide on-line courses for undergraduate and graduate students to study at

NASCIMENTO, A. M.

SHI, Y.

SALES, A. I.

home<sup>XII</sup>.

From that, it was possible to carry out classes and transmissions for millions of Chinese students, in addition to making it possible to organize the collection of didactic support content, as well as the storage of the transmissions of classes that can be accessed at any time, whenever students feel the need for revision<sup>XIII</sup>. In addition, content and programming were made available by CCTV (state TV channel) for students to access<sup>XIV</sup>.

For the success of the implementation of online educational platforms in China, the support of teachers was essential. In this sense, an online training was developed by Chaoxing, a famous online education company. Additionally, the teachers learned how to use Dingtalk and Tencent Meeting to meet its colleges, discuss with students, and even interview with applicants for master programs<sup>XV</sup>.

In Dingtalk there are specific spaces for the training of teachers, aiming to facilitate the transition from classroom teaching methodology to teaching distance learning. Bearing in mind that, it could already be predicted that teachers felt the great impact on their careers, in the sense that in addition to being at the center of a serious epidemic, they still needed to learn to work without personal contact, but with the great mission to shorten distances and establish a pedagogical link, as well as creating an interactive space for their students<sup>XVI</sup>.

In the spaces directed to training, teachers receive the necessary instructions on the tools existing in the portals and their respective functionalities, besides being guided on the need to prepare a new work plan. Then, with the appropriate technological support, they began to record their classes and develop programmatic content that make up the collection of didactic material for their students. So, for elementary school students it was decided that the contents would be broadcasted through the state channel. And, for high school students, through the online platform consisting of 169 lessons and 12 curricular subjects.

In relation to higher education, China determined different criteria conducting academic activities, which are structured according to the regions most and least affected by the pandemic of COVID-19. It was thought that activities could be soon resumed, but with the pandemic scenario installed in the country most universities closed their doors until March 2020. It required emergency and palliative measures that needed to be determined. Therefore, as in school education, universities have adopted distance learning platforms with tutoring available to guarantee the continuity of studies, following what the Chinese government's motto "stop classes, but don't stop learning says".

The schedules for the gradual resumption of academic activities follow, as a fundamental criterion, the data found through surveys carried out by the competent health agencies, which map the cities where significant falls in the cases of Covid-19 occur. Therefore, as already mentioned, the return to activities occurs specifically in each region of the country. In eastern China, in the city of Huaian, for example, classes resumed after the relaxation of social isolation rules at the end of March 2020, while at universities in Shanxi, Jiang and Qinghai provinces (located in the autonomous region of Xinjiang Uygur), which resumed their activities at the end of April.

China's Ministry of Education is emphatic when explaining to society about the importance of resuming classes according to the following three steps: resume classes after the epidemic situation is basically under control, do not start again before prevention procedures and control of universities are in place and do not resume classes when the safety of public health teachers and students cannot be guaranteed<sup>XVII</sup>.

Therefore, it can be noted that education management in times of the COVID-19

NASCIMENTO, A. M.

SHI, Y.

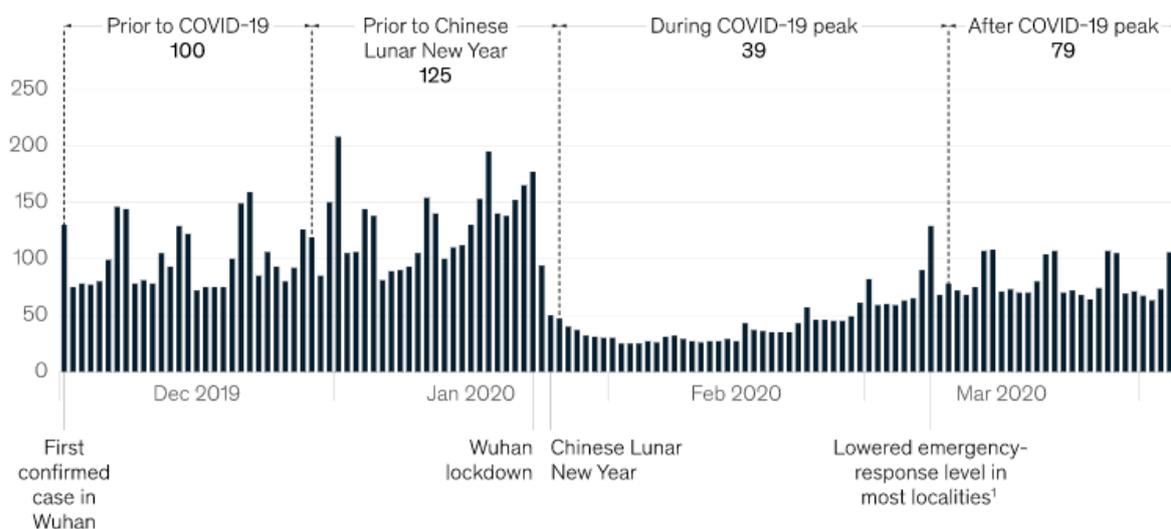
SALES, A. I.

pandemic in China was managed locally, identifying the real situation in each region, stipulating specific safety criteria for the exercise of activities, which ensured the effectiveness of the tactical coping strategy.

### E-commerce

The economic consequences of the pandemic were very intense during the peak of the disease in China, but even after controlling the outbreak, it is possible to notice physical stores average consumption remains 21% lower than it used to be before they exploded into a pandemic, as shown in Figure 1.

**Figure 1.** Average consumption in physical stores from December 2019 to March 2020  
Average daily China offline consumption, % (100% = daily average consumption in Dec 2019)



Source: Baig et al. (2020)

Besides the notable economic downturn generated by coronavirus pandemic, consumption decrease is also encouraged by digital e-commerce solutions experienced during social isolation period, varying from digital payments - which were already widely adopted in China for logistics solutions - to digital platforms.

As well as the use of technology has become an important foundation for education affordability, it also provided opportunities to circumvent the problems that have risen in China's economy. Thus, based on China's experience to deal with the economic consequences of the pandemic, Huang, Lin, Wang e Xu (2020) suggest to “thoroughly digitize the economy, mobilize private capital and use internet financing to provide targeted credit support to SMEs”<sup>XVIII</sup>.

Regarding the digitization of the economy, China has a relative more comfortable previous scenario than other countries. According to the World Bank (2017), 80% of adults in China have a bank account (compared to 70% in Brazil), and 97% of online retail transactions were performed through a smartphone, in 2018<sup>XIX</sup>.

As a result, the Chinese government have decided to allow and stimulate technology

NASCIMENTO, A. M.

SHI, Y.

SALES, A. I.

companies to act as retail banks. Huang et al. (2020), claim that fintech Internet platforms have advantages over traditional banks because they are able to perform relatively complete credit ratings, specifically for Small and Medium Enterprises (SME) and individual e-commerce sellers, through the use of big data; monitoring of debtors in real time; lending without geographical restrictions, allowing credit to be provided to SMEs on a larger scale; ability to complete online transactions remotely, helping to prevent and control the virus spread.

Therefore, China recommends that fintech platforms, such as e-commerce platforms, digital financing platforms, blockchain platforms and supply chain financing, be encouraged to provide loans to SMEs, so they can make better use of digital financial platforms to solve financing constraints<sup>XX</sup>. Companies such as the digital giant Alibaba Group, through Ant Financial and its virtual bank, MYbank, in partnership with financial institutions in China already provide financial support to micro and small companies across the country to help resume work, as well as efforts to expand production. In addition to loans, interest rate reduction, exemption from transaction fees are examples of actions offered by these companies.

In addition, shopping on virtual channels has accelerated due to travel restrictions and consumers' reluctance to engage in face-to-face activities. Furthermore, 74% of Chinese consumers made purchases at the peak of the pandemic social isolation and 21% spent more<sup>XXI</sup>.

### **Final considerations**

Even with the history of pandemics already faced by humanity, the coronavirus has led our generation to deal with increasingly challenging situations. In this sense, it is important that countries that are still facing the peak of the pandemic learn how regions that are beginning to overcome themselves are acting.

To this end, information and communication technologies are shown to be allies in mitigating the consequences generated by the pandemic. Whether through the provision of classes in virtual format for students of different levels of education, or by preparing the entire production chain for electronic commerce, the solution to this situation goes through a digital transformation.

Naturally, solutions will need to be refined over time, but China's rapid response to teacher training and large-scale digital infrastructure availability has facilitated the deployment of distance education solutions.

The same happened in e-commerce: the high degree of adoption of digital payment methods, credit facilitated to small businesses by technology companies using artificial intelligence solutions and an efficient logistics network made the transition less acute.

Thus, countries that want to deal with the economic consequences responsibly can follow the steps already used by China in the implementation of ICTs. As the virus can become endemic and even the most optimistic vaccine projections will still take a significant amount of time to be made available across the globe, pursuing digital transformation proves to be a more effective and sanitarily responsible solution than those that have been currently adopted in Brazil.

NASCIMENTO, A. M.

SHI, Y.

SALES, A. I.

**Notes**<sup>I</sup> Docente Permanente do Mestrado Profissional em Administração da Universidade de Pernambuco.<sup>II</sup> Docente da Universidade Central de Finanças e Economia de Pequim.<sup>III</sup> Mestranda do Mestrado Profissional em Administração da Universidade de Pernambuco.<sup>IV</sup> Usher, Bhullar & Jackson, 2020.<sup>V</sup> Gern & Hauber, 2020.<sup>VI</sup> Rosenthal & Charles, 1989; Maffioli, 2020.<sup>VII</sup> Waugh & Streib, 2006.<sup>VIII</sup> Andrew, Arlikattib, Chatterjee & Ismayilovc 2018.<sup>IX</sup> Janssen, Lee, Bharosa & Cresswell, 2010.<sup>X</sup> Brug et al., 2004.<sup>XI</sup> BRASIL, 2020.<sup>XII</sup> Ministry of Education, 2020.<sup>XIII</sup> Ministry of Education, 2020.<sup>XIV</sup> Estadão, 2020.<sup>XV</sup> ESTADÃO, 2020; XINHUA, 2020.<sup>XVI</sup> Braga & Fonseca, 2020, p.11.<sup>XVII</sup> CCTV, 2020.<sup>XVIII</sup> HUANG et al., 2020.<sup>XIX</sup> XINHUA, 2019.<sup>XX</sup> HUANG et al., 2020.<sup>XXI</sup> BAIG et al., 2020.**References**

ANDREW, S.A., ARLIKATTIB, S., CHATTERJEEA, V., ISMAYILOVC, O. Ebola crisis response in the USA: Communication management and SOPs. **International Journal of Disaster Risk Reduction**. v. 31, pág 243-250, 2018.

BAIG, A; HALL, B.; JENKINS, P.; LAMARRE, E.; MCCARTHY, B. The COVID-19 recovery will be digital: A plan for the first 90 days. **McKinsey Digital**, 2020.

BRAGA, Eduardo dos Santos de.; FONSECA, Giselle Rôças de Souza. Ensino de Matemática na Educação a Distância: Estado do Conhecimento EaD em Foco nos últimos 10 anos. **EaD em Foco**, v. 10, n. 1, p. 12, 7 abr. 2020. Acesso em 23 de Abr de 2020.

BRASIL, Medidas Econômicas de Combate à Covid-19, 2020. Disponível em: <https://www.gov.br/economia/pt-br/centrais-de-conteudo/apresentacoes/2020/2020-04-15-medidas-enfrentamento-da-crise-1530hs.pdf> . Acesso em 17 abr. 2020.

BRUG, J., ARO, A.R., OENEMA, A., ZWART, O., RICHARDUS, J.H., BISHOP, G.D. SARS risk perception, knowledge, precautions, and information sources, the Netherlands, **Emerg. Infect. Dis.** v. 10(8), pág 1486-1489, 2004.

**CCTV, 2020, Will the college entrance examination be postponed this year? Latest response from the Ministry of Education,** <http://m.news.cctv.com/2020/03/14/ARTIj70LyiTikOWbRxW2eOxz200314.shtml>.

---

DIGITAL TRANSFORMATION TO DEAL WITH THE PANDEMIC IN CHINA: THE CASE OF  
DISTANCE EDUCATION

NASCIMENTO, A. M.

SHI, Y.

SALES, A. I.

---

CHINA'S ONLINE RETAIL SALES HIT 3.86 TLN YUAN IN JAN-MAY: report. **Xinhua**. Disponível em: [https://www.xinhuanet.com/english/2019-06/23/c\\_138167136.htm](https://www.xinhuanet.com/english/2019-06/23/c_138167136.htm). Acesso em: 19/05/2020.

CHINA FOCUS: digital maps help China track people flows amid epidemic. **Xinhua**. Disponível em: [http://www.xinhuanet.com/english/2020-02/17/c\\_138792319.htm](http://www.xinhuanet.com/english/2020-02/17/c_138792319.htm). Acesso em 24 de Abr de 2020.

CHINA TO HELP TEACHERS ENHANCE ONLINE TEACHING ABILITY AMID COVID-19 OUTBREAK. **Xinhua**. Disponível em: [http://www.xinhuanet.com/english/2020-03/17/c\\_138888171.htm](http://www.xinhuanet.com/english/2020-03/17/c_138888171.htm). Acesso em 10 de Abr de 2020.

CHINA TO TAKE DIFFERENTIATED SCHEDULE FOR RESUMING CLASSES IN UNIVERSITIES: official. **Xinhua**. Disponível em: [http://www.xinhuanet.com/english/2020-03/31/c\\_138935136.htm](http://www.xinhuanet.com/english/2020-03/31/c_138935136.htm). Acesso em 17 de Abr de 2020.

CORONAVÍRUS FORÇA CHINA A LANÇAR PLATAFORMA DE EDUCAÇÃO À DISTÂNCIA. **Estadão**. Disponível em: <https://link.estadao.com.br/noticias/geral,china-lanca-plataforma-para-estudantes-estudarem-em-casa,70003201709.amp>. Acesso em 10 de Abril de 2020.

EC, COVID-19: Commission sets out European coordinated response to counter the economic impact of the Coronavirus, 2020. Disponível em: [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_20\\_459](https://ec.europa.eu/commission/presscorner/detail/en/ip_20_459). Acesso em 17/05/2020.

FEBRABAN, 2019. Pesquisa FEBRABAN de Tecnologia Bancária 2019. Disponível em: <https://cmsportal.febraban.org.br/Arquivos/documentos/PDF/Pesquisa-FEBRABAN-Tecnologia-Bancaria-2019.pdf>. Acesso em 19/05/2020.

Fernandes, Nuno. Economic Effects of Coronavirus Outbreak (COVID-19) on the World Economy. <https://insight.iese.edu/fichaMaterial.aspx?pk=162907&idi=2&origen=1&ar=7>

FIOCRUZ, Fundação Oswaldo Cruz, 2020. Disponível em: <https://portal.fiocruz.br/publicacoes>. Acesso em 20 abr 2020.

FMI, Fundo Monetário Internacional, IMF Data, 2020. Disponível em: <https://www.imf.org/en/Data>. Acesso em 17 de abr de 2020.

GIGANTE CHINESA DE COMÉRCIO ELETRÔNICO ALIBABA ANUNCIA INICIATIVA DE AJUDA ÀS PMEs. **Xinhua**. Disponível em: [http://portuguese.xinhuanet.com/2020-04/08/c\\_138957278.htm](http://portuguese.xinhuanet.com/2020-04/08/c_138957278.htm). Acesso em 19/05/2020.

GERN, K.; HAUBER, P. Coronavirus hält Weltkonjunktur in Atem. **Ökonomische Trends**, 2020.

HUANG, Yi, LIN, Chen, WANG, Pengfei, XU, Zhiwei. Saving China from the Coronavirus and Economic Meltdown: Experiences and Lessons. In: Mitigating the COVID economic crisis: act fast and do whatever it takes. **London: Centre for Economic Policy Research**, 2020. - P.

NASCIMENTO, A. M.

SHI, Y.

SALES, A. I.

---

77-91. Disponível em : <https://repository.graduateinstitute.ch/record/298226>.

JANSSEN, M., LEE, J., BHAROSA, N., CRESSWELL, A. Advances in multiagency disaster management: key elements in disaster research. **Inf. Syst. Front.** v.12 (1), pág 1-7, 2010.

MAFFIOLI, E. M. How Is the World Responding to the 2019 Coronavirus Disease Compared with the 2014 West African Ebola Epidemic? The Importance of China as a Player in the Global Economy. **American Journal of Medicine and Hygiene Perspective**, 2020.

MENDES, Marcos J. 2008. Os sistemas tributários de Brasil, Rússia, China, Índia e México: comparação das características gerais.(Texto para Discussão, n. 49) Brasília: Senado Federal, 2008. Disponível em:

OMS, Organização Mundial da Saúde, 2020. Disponível em: <https://www.who.int/eportuguese/publications/pt/>. Acesso em: 20 abr 2020.

*Ministry of Education, The online education in primary and middle schools during the epidemic and the arrangement of the future work,* [http://www.moe.gov.cn/fbh/live/2020/51987/twwd/202005/t20200514\\_454317.html](http://www.moe.gov.cn/fbh/live/2020/51987/twwd/202005/t20200514_454317.html).

ROSENTHAL, U., CHARLES, M. T., HART, P.T. Coping with crisis: The management of disasters, riots and terrorism. Springfield: Charles C. Thomas, 1989.

SENADO.<https://www12.senado.leg.br/publicacoes/estudos-legislativos/tipos-de-estudos/textos-para-discussao/td-49-os-sistemas-tributarios-de-brasil-russia-china-india-e-mexico-comparacao-das-caracteristicas-gerais>