

Driving Innovation in Times of Crisis

CASE STUDY

COVID-19 Global
Pandemic

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Table of Contents

Introduction	2
Crisis and Innovation: The COVID-19 Pandemic Case	3
About the Driving Innovation in Times of Crisis Initiative	9
Global Federation of Competitiveness Councils	10

Introduction

Societies continue to grapple in a world filled with crises, ranging from climate change and extreme weather events to high inflation and rising cost of living, energy and food insecurity, as well as armed conflicts and critical infrastructure cyber-attacks. In sum, crises have become a constant, and learning to navigate turbulence is a highly valued competitive differentiator.

In 2022, the GFCC and its member, the Japan Science and Technology Agency (JST), started a new initiative called **Driving Innovation in Times of Crisis (DITC)** to deepen the understanding of crises and facilitate innovation and prosperity in adversity.

Through a series of activities and research products, the DITC aims to develop actionable recommendations to empower businesses, governments, and organizations to thrive in instability and unlock new opportunities for innovation and prosperity.

In April 2022, during an exclusive meeting, our members and fellows chose three case studies that were relevant to our community and needed in-depth analysis. Those were the 9/11 terrorist attacks, the COVID-19 pandemic, and the ongoing Ukraine armed conflict.

We are proud to present in this document the responses and innovations arising from the COVID-19 pandemic as part of our effort to unveil the concepts and ideas that permeated this crisis and their implications.

We thank Ailun Gu, a postdoctoral research fellow at the University of Auckland, for conducting academic research for this document, and all the experts in our community who made themselves available for interviews: Dr. Kandeh Kolleh Yumkella, Dr Jonathan Filippou, Priscila Ferraz, and Dr Michinari Hamaguchi.

Finally, we thank our esteemed member JST for the inspiration, support, partnership, and funding throughout the initiative.

We are proud to present this case study in the COVID-19 pandemic, and we hope you find it useful.

Crisis and Innovation: The COVID-19 Pandemic Case¹

COVID-19 is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that caused a global pandemic and a global public health crisis.² The novel virus was first identified and reported by Wuhan, China, in December 2019, and then swiftly spread across the world.³ As of 12 October 2023, the pandemic has caused 771,191,203 cases, including 6,961,014 deaths. As of 12 October 2023, a total of 13,513,324,853 vaccine doses have been administered.⁴

Recognition has been key to an effective response to the pandemic. The interview results showed that the point of recognition varied among countries, institutions, and groups of individuals due to differences in past experience, knowledge of public health crises, and public awareness of the pandemic. Early recognition is critical to preventing the spread of the pandemic as it facilitates multisector collaboration to effectively adopt appropriate measures so the cases and deaths can be contained to a minimum.

Apart from the direct health impacts, the pandemic and the prevention measures have brought cascading and systemic risks and effects on societies and economies, impacting livelihoods, gender, education, and political and social dimensions.⁵

A multitude of issues and challenges have arisen because of the COVID-19 pandemic on various fronts. Among these challenges are:

1. **Public health crisis:** The virus has caused a worldwide health crisis that has overloaded healthcare systems and resulted in high number of infections and fatalities. The healthcare system is under pressure due to the high demand for medical resources like hospital beds, ventilators, and personal protective equipment (PPE).
2. **Social issues:** Routines and social structures have been disrupted by the pandemic, resulting in increased domestic violence cases, mental health issues, and isolation. The education system has also been impacted by school closings and remote learning, leaving many students without adequate access to learning resources.
3. **Economic downturn:** Due to lockdowns and restrictions brought on by COVID-19, businesses have been forced to shut down or operate at reduced capacity. Numerous industries, including tourism, hospitality, and aviation, have been negatively impacted, and many people have lost their jobs.
4. **Global inequality:** The pandemic has brought to light and exacerbated the existing disparities within and between countries. Developing countries with limited healthcare infrastructure and resources have been disproportionately affected, and marginalized communities have experienced higher infection rates and worse access to healthcare.

¹ This case was researched and written by Ailun Gu, Research Fellow at GFCC. Research included interviews (with Dr Kande Koleh Yumkella, Dr Jonathan Filippou, Priscila Ferraz, and Dr Michinari Hamaguchi who are company executives, government officials, practitioners, and policymakers directly responsible for responses to the crisis in Sierra Leone, UK, Brazil, and Japan.), archival footage, and desk research.

² [https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/naming-the-coronavirus-disease-\(covid-2019\)-and-the-virus-that-causes-it](https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/naming-the-coronavirus-disease-(covid-2019)-and-the-virus-that-causes-it).

³ <https://www.who.int/news/item/27-04-2020-who-timeline---covid-19>.

⁴ <https://covid19.who.int/>.

⁵ <https://www.undrr.org/rethinking-risk-times-covid-19>.

5. Misinformation and trust issues: The pandemic has also sparked a crisis of misinformation and trust. Controlling the virus and putting into place efficient public health measures have become more difficult due to the rapid spread of false information and conspiracy theories.
6. Multilingual communication issues: The unprecedented outbreak of COVID-19 has brought multilingual crisis communication to the forefront as it is critical that every individual has access to timely and accurate information in their language as one of the essential prevention measures. On the one hand, measures to prevent the spread of the virus, such as lockdowns, quarantine, and social distancing, resulted in the proliferation of the use of social media to ease feelings of estrangement. On the other hand, the severity and global impact of the pandemic have intensified the perennial, often ignored need for translation and interpreting to ensure inclusiveness and social equality.
7. Challenges of the food system: The pandemic has worsened food insecurity and hunger, especially among vulnerable populations. It results from broken supply chains, lost income, and restricted access to food assistance programs.

Globally, these COVID-19-related issues and challenges continue to present significant obstacles for individuals, communities, and countries, which require coordinated efforts to mitigate their impact and promote recovery.

Focus on: Operation Warp Speed

Crisis Recognition:

An effective response to the COVID-19 crisis takes more than just recognizing the pandemic's presence and acknowledging the issue in healthcare. It entails taking a comprehensive and proactive strategy to treating cases, safeguarding healthcare

professionals, and optimizing healthcare resources. The World Health Organization (WHO) declared the COVID-19 outbreak a global pandemic on March 11, 2020,⁶ three months after the very first case was identified and reported by China in December 2019.

The Crisis and its Dangers:

The COVID-19 crisis has caused serious risks and dangers for the healthcare industry. The key aspects of dangers faced by the healthcare sector during the pandemic include overwhelmed healthcare systems,⁷ the emergence of variants and evolving threats,⁸ financial strain on healthcare providers,⁹ disruptions to routine vaccinations and preventive care,¹⁰ vulnerable populations with pre-existing conditions,¹¹ and public health misinformation.¹²

Hazards of Inadequate Response:

An inadequate response to the COVID-19 pandemic, especially within the healthcare sector, can have a variety of hazardous consequences. Overwhelmed healthcare systems caused by inadequate preparation and response can result in a lack of hospital beds, ICU capacity, and essential medical supplies, which leads to patients not getting the treatment they need. The emergence of new virus variants caused by a lack of timely and appropriate response can create persistent dangers and threats for the public health system.¹³ The economic viability of the healthcare sector may be hampered by the financial effects of an inadequate response, including decreased revenue from non-COVID services and increased expenses.¹⁴ Possible outcomes of disruptions to routine vaccinations and preventive care include long-term public health effects and outbreaks of diseases that can be prevented through vaccination. Mortality rates can be higher among vulnerable populations with COVID-19 and other medical conditions due to inadequate healthcare response.¹⁵

6 WHO Director-General's opening remarks at the media briefing on COVID-19 - 21 December 2020 (<https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---21-december-2020#:~:text=The%20pandemic%20has%20exploited%20and,new%20ways%20of%20doing%20them.>)

7 COVID-19 double jeopardy: the overwhelming impact of the social determinants of health (<https://equityhealthj.biomedcentral.com/articles/10.1186/s12939-022-01629-0>).

8 The Covid virus is an ever-evolving threat (<https://www.ft.com/content/c63df330-d337-4efb-83ec-74da1dbdd802>).

9 Economic impact of COVID-19 pandemic on healthcare facilities and systems: International perspectives (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7670225/>).

10 Impact of the COVID-19 pandemic on routine vaccine landscape: A global perspective (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10294763/#:~:text=Global%20coverage%20of%20other%20routine,a%20reduction%20by%20-9%25.&text=An%20estimate%20of%2025%20million,compared%20with%20that%20in%202009>).

11 People with Certain Medical Conditions (<https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html>).

12 The Danger of Misinformation in the COVID-19 Crisis (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7721433/>).

13 Global Challenges to Public Health Care Systems during the COVID-19 Pandemic: A Review of Pandemic Measures and Problems (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9409667/>).

14 The Effects of Covid-19 on Financial-Economic and Performance Efficiency of Hospitals (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10329507/>).

15 Identification of Vulnerable Populations and Areas at Higher Risk of COVID-19-Related Mortality during the Early Stage of the Epidemic in the United States (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8070560/>).

Response and Innovations:

With the objective of expediting the development and delivery of safe and efficient COVID-19 vaccines and medicines, the US government launched the Operation Warp Speed (OWS) in May 2020.¹⁶ OWS was a Public-Private Partnership with close collaboration among several federal agencies (e.g., the Department of Health and Human Services (HHS), the Department of Defense (DoD), and other public organizations) and commercial pharmaceutical businesses. Billions of dollars were allocated to OWS to assist its research, clinical trials, production, and distribution of vaccines and treatment.

OWS was a bold and ambitious program that provided funding and resources to expedite the vaccine against COVID-19 by implementing 3 major measures: composition of a diverse portfolio of vaccine candidates based on different technologies; enabling of a compressed development timeline that assured efficacy and safety working in constant collaboration with vaccine developers and the FDA; and the removal of barriers to commercial scale manufacturing of those vaccines.

The most notable vaccine candidates included Pfizer/BioNTech, Moderna, Johnson & Johnson, and AstraZeneca.¹⁷ OWS selected its candidates based on the existence of robust preclinical data that pointed towards great chance for efficacy and safety, the feasibility of entering phase 3 clinical trials by November 2020 with OWS support, and fast large scale manufacturing possibility by Mid-2022.

OWS facilitated the compressed development timeline by finding solutions to allow the concurrent execution of multiple vaccine development process steps (e.g., clinical trials, manufacturing, and distribution). To ensure the delivery of millions of doses right away after receiving authorization, OWS made investments in the production capacity of vaccine candidates before they were given regulatory permission. To speed up the approval procedure without sacrificing safety standards, OWS worked with regulatory organizations, including the U.S. Food and Drug Administration (FDA).

Regarding manufacturing challenges, OWS helped the identification of manufacturing partners who could ramp up vaccine production, assisted companies resolve barriers to procurement of critical equipment and common supplies, and helped fill gaps in available workforce expediting visas and temporarily providing DoD personnel to fill out some positions.

Despite the fact that OWS played a significant role in the fight against COVID-19 in the U.S., there are criticisms and concerns about lack of transparency and unfair distribution as well as issues with public skepticism and hesitancy over vaccine safety due to the speedy development process.¹⁸

Highlight: COVID-19 Vaccine Rapid Technology Transfer from AstraZeneca to Fiocruz

Despite the Brazilian government's initial denial and delayed recognition of the COVID-19 pandemic and failure to respond, Fiocruz, a scientific institution for research and development in biological sciences located in Rio de Janeiro, Brazil, identified the risks in early 2020 and took prompt action.

In February 2020, Bio-Manguinhos (the biopharmaceutical company inside Fiocruz) developed the molecular kit to detect SARS-CoV-2 in 40 days. Fiocruz collaborated with the Ministry of Health of Brazil and the Pan American Health Organization (PAHO) to provide training on laboratory diagnosis of the virus which enhanced practitioners' knowledge to perform early diagnosis of COVID following WHO protocols.

In September of 2020, Fiocruz signed an agreement for the Technology Transfer of the COVID-19 vaccine with AstraZeneca, while it was still under development. The goal was to achieve 100% national production of the immunizing agent. The technological partnership sped up the production of the Active Pharmaceutical Ingredient (API) at the Bio-Manguinhos/Fiocruz facilities.¹⁹

16 Operation Warp Speed: Accelerated COVID-19 Vaccine Development Status and Efforts to Address Manufacturing Challenges (<https://www.gao.gov/products/gao-21-319>).

17 There are three main platforms: Pfizer and Moderna used mRNA technology, Janssen and AstraZeneca vaccine candidates consisted of replication-defective live-vector platform, and Sanofi/GSK used recombinant-subunit-adjuvanted protein technology.

18 The crash landing of 'Operation Warp Speed' (<https://www.politico.com/news/2021/01/17/crash-landing-of-operation-warp-speed-459892>).

19 <https://www.paho.org/en/news/7-2-2020-new-coronavirus-fiocruz-ministry-health-brazil-and-paho-provide-training-laboratory>.

Fiocruz's multi sector collaborations could not have been realized without legislative, administrative and institutional flexibility. It usually takes around 5 to 10 years to complete an immunobiological technology transfer. In the face of urgency, Fiocruz designed a specific governance and management model to compress timelines while managing the risks of every decision. In addition, the flexibility of science and technology legislation facilitated the R&D process, for example allowing parallel phases of clinical trials.

The decision-making on the manufacturing process was challenging. For instance, when they needed to start to buy raw materials and equipment for the API production, the organization did not have a complete production process designed. Therefore, Fiocruz had to adopt a more generic production process, based on the opinions of a group of local specialists in alignment with AstraZeneca's production protocol. Such practice was unimaginable before the outbreak of the pandemic.

As a result, the technology transfer process was completed in January of 2022 with the issuance of the authorization from Anvisa (the Brazilian National Regulatory Agency).

underlining the need for stronger global pandemic preparedness and cooperation. It revealed severe disparities in access to medical resources, tests, and supplies, both within and between countries and regions. Mistrust and geopolitical conflicts made international coordination more difficult.

Hazards of Inadequate Response:

The virus can continue to spread if there is insufficient global response, which might result in the creation of new variations that are more contagious or resistant to current vaccinations and treatments. Inadequate response can lead to vaccine inequity, which could worsen global health disparities and make it more difficult to contain the virus. Disruptions in global supply networks could affect the accessibility of essential medical supplies.

Response and Innovations:

The COVID-19 pandemic has brought attention to the value of international cooperation in responding to public health crises. In this setting, a number of innovations and projects have developed to enhance global collaboration and readiness.

COVAX, the COVID-19 Vaccines Global Access initiative, was launched on April 24, 2020. It was established in response to the COVID-19 pandemic to ensure equitable access to vaccines for people worldwide, especially in low- and middle-income countries. It was co-led by Gavi, the Vaccine Alliance, the World Health Organization (WHO), and the Coalition for Epidemic Preparedness Innovations (CEPI), and it represents a collaborative effort between governments, global health organizations, and vaccine manufacturers.²⁰ It aids in vaccine research and development, funding clinical trials and supporting technology transfer to vaccine producers worldwide.²¹ To guarantee greater vaccination coverage, wealthy countries taking part in COVAX are urged to share doses with less developed ones.²² There is a varied portfolio of vaccine candidates and producers, including those from Pfizer, AstraZeneca, Johnson & Johnson, and others.²³

During the pandemic, several organizations, initiatives, and attempts were made to provide equal access to vaccinations throughout the world through global vaccine distribution and supply chain management. Apart from the COVAX Facility as mentioned above, other examples include the African Union's African Vaccine Acquisition Task Team (AVATT) (which was established for the purpose of securing COVID-19 vaccination doses for African countries);²⁴ UNICEF's leverage of existing

Focus on: Global Coordination

Crisis Recognition:

The crisis made it clear how crucial early warning systems and international monitoring networks are for monitoring and reporting new infectious illnesses. Organizations such as WHO and CDC played a critical role in monitoring possible health threats and sending alerts. It highlighted the importance of timely and transparent information sharing and clear and consistent communication with the public.

The Crisis and its Dangers:

The pandemic highlighted an absence of worldwide preparedness. The rapid spread of a highly contagious virus was difficult for many countries and international organizations to control,

20 [chrome-extension://bdfcnmeidppjeaggnmidamkiddifkdib/viewer.html?file=https://www.who.int/docs/default-source/coronaviruse/transcripts/transcript-who-actlaunch-24apr2020.pdf](https://www.who.int/docs/default-source/coronaviruse/transcripts/transcript-who-actlaunch-24apr2020.pdf)

21 [Protecting human rights in the COVAX roll-out \(https://www.gavi.org/covax-facility/protecting-human-rights\)](https://www.gavi.org/covax-facility/protecting-human-rights).

22 [Dose-sharing: how global solidarity can help curb the pandemic \(https://www.unicef.org/supply/stories/dose-sharing-how-global-solidarity-can-help-curb-pandemic\)](https://www.unicef.org/supply/stories/dose-sharing-how-global-solidarity-can-help-curb-pandemic).

23 <https://www.gavi.org/covax-facility>.

24 <https://africacdc.org/tag/avatt/>.

supply chain infrastructure and collaboration with COVAX;²⁵ the Global Fund's support in the distribution of COVID-19 vaccines, diagnostic tools, and treatments to countries in need;²⁶ air cargo transport organizations such as the International Air Transport Association's (IATA) partnership with governments, airlines, and logistics providers to establish air transport corridors for vaccines.²⁷

Specifically, a COVID-19 testing laboratory was established in Makeni City, Sierra Leone in August 2020. This was a joint effort involving the government of Sierra Leone, WHO, the US Centers for Disease Control, and other local and international partners.²⁸ The lab reduced the turnaround time for testing in the northern region, thus improving the country's response effort; it is also set to be utilized for testing other diseases and enhancing preparedness and resilience for future epidemics.²⁹

In preparation for the vaccine, Japan launched the hub following ambitious targets set by the G7's '100 Days Mission'.³⁰ SCARDA (Strategic Center of Biomedical Advanced Vaccine Research and Development for Preparedness and Response) selected 11 research sites, including five universities and six research institutions, based on their expertise and specialization.

GISAID (Global Initiative on Sharing All Influenza Data) was established in 2008. It was created to facilitate the sharing of genetic sequence data and other information related to influenza viruses. It encourages international cooperation by bringing researchers, healthcare providers, and public health organizations together to share crucial information and ideas. Since its founding, GISAID has broadened its scope to include the sharing of data related to various respiratory viruses, including the coronavirus responsible for COVID-19 (SARS-CoV-2). During the pandemic, the high-quality, curated initial set of genomes in the GISAID's EpiCoV database enabled the rapid development of diagnostic and prophylactic measures against SARS-CoV-2, including the first diagnostic tests³¹ and the first vaccines.³²

Digital Health Certificates and Vaccine Passports are paper-based or digital certificates that serve as evidence of individuals' COVID-19 vaccination status, test results, or viral recovery. During the pandemic, these certificates are intended to promote safe international travel, access to public areas, and involvement in a range of activities. Some examples include contact tracing apps (e.g., Singapore's TraceTogether and Australia's COVIDSafe), the EU Digital COVID Certificate (a.k.a. the EU Green Pass), CommonPass (a digital health passport developed by the Commons Project and the World Economic Forum), the International Air Transport Association (IATA) Travel Pass, IBM Digital Health Pass (a mobile app that allows users to share their COVID-19 status with organizations and venues that require proof of vaccination or testing), Clear Health Pass, VeriFLY, vaccine verification portals (e.g., New York's Excelsior Pass and California's Digital COVID-19 Vaccine Record), etc.

Focus on: Universities³³

Crisis Recognition:

Like all nations and businesses globally, universities were surprised by the spread of the new coronavirus and the devastating effects of the pandemic. When the COVID-19 outbreak hit universities in March 2020, they joined governments, businesses, and other organizations across the globe in the largest case of "learning by doing" in history. Nearly every aspect of universities' multi-faceted mission has been affected—teaching, research and development, student housing and services, provision of health care, athletics, collaborations with businesses, and engagements in the local communities in which they reside.

The Crisis and its Dangers:

The shutdown posed a risk for every university from fulfilling its own mission to educate. Fieldwork and laboratory operations were seriously disrupted, students and teachers experienced hardship adapting to virtual learning, the lack of social interaction and community bonding posed a significant challenge, raising alarm about student mental health and trauma. COVID-19 seriously affected universities financially, leading to budget cuts

25 <https://www.unicef.org/supply/stories/delivering-covax-supplies-during-supply-chain-crisis-hope-consortium-steps-support-unicef>.

26 https://www.theglobalfund.org/media/13174/partnership_gavi-global-fund_report_en.pdf.

27 <https://www.iata.org/en/services/compliance/compliance-requirements-network/#::-text=IATA%20partners%20with%20governments%20around,time%20to%20all%20aviation%20stakeholders>.

28 <https://www.afro.who.int/news/new-covid-19-testing-laboratory-commissioned-rural-sierra-leone-supported-who>.

29 <https://go.gale.com/ps/i.do?p=EAIM&u=anon-b56e7b3&id=GALE|A634345341&v=2.1&it=r&sid=sitemap&asid=08d31d38>.

30 <https://www.globalgovernmentforum.com/japan-launches-new-vaccine-research-hub-to-quicken-future-pandemic-response/>.

31 Bohn MK, Mancini N, Loh TP, Wang CB, Grimmmer M, Gramegna M, et al IFCC interim guidelines on molecular testing of SARS-CoV-2 infection. *Clin Chem Lab Med*. 2020;58(12):1993-2000. doi: 10.1515/cclm-2020-1412.

32 Polack FP, Thomas SJ, Kitchin N, Absalon J, Gurtman A, Lockhart S, et al Safety and efficacy of the BNT162b2 mRNA covid-19 vaccine. *N Engl J Med*. 2020;383(27):2603-15. doi: 10.1056/NEJMoa2034577.

33 This mini-case is based on [Shift: Universities in Transformation](#), a report released by the GFCC on October 19, 2022. The report includes information and data collected through interviews conducted with university leaders in the GFCC Community between November 2020 and March 2021 in eight countries: Australia, England, Japan, New Zealand, Qatar, Portugal, Ukraine, and the United States.

and spending restrictions. During lockdowns, revenues from dormitories, school catering, and boarding fees were cut off. Grants and research funding shrank due to economic instability. In parallel, some institutions temporarily reduced tuition fees to make up for the forced transition to online learning, which affected total revenues.

Hazards of Inadequate Response:

Universities are densely populated environments, with students, faculty, and staff living and working in close proximity to each other. If universities had not quickly adapted to COVID-19 restrictions, the virus could have spread rapidly through these communities, leading to a high number of infections and deaths. On the other hand, if universities simply shut down all educational activities, they may have been forced to close altogether, disrupting the education of millions of students around the world. This would have led to even greater financial hardship as universities rely on tuition fees and other sources of revenue to operate that could have led to job losses and cuts to programs and services. The COVID-19 pandemic has had a significant social and emotional impact on students, faculty, and staff. A lack of quick solutions for these issues could have led students to feel isolated and unsupported, and faculty and staff may have felt overwhelmed and stressed.

Response and Innovations:

The most immediate and dramatic change when the COVID-19 pandemic hit universities was the rapid shift to distance learning, either online or hybrid learning. The first response was to move everything online as fast as possible. For many universities, this meant crash courses for faculty and staff on using online platforms and providing extra resources for students to participate in their education from a remote setting.

With the widespread shift to online learning during the COVID-19 pandemic, market demand for digital tools to teach and learn remotely soared. One of the most significant changes in higher education is the high demand for and popular use of video conferencing platforms and tools such as Zoom, Microsoft Teams, BlueJeans Meetings, Cisco Webex Meetings, and GoToMeeting. These tools are still widely used as they are convenient, flexible and cost-effective ways to offer lectures, hold office hours, and connect with stakeholders around the world.

The rapid switch to online learning challenged universities to deliver quality education in a virtual or blended environment in many cases for the first time. Universities responded by implementing strategies on different fronts. A key pillar involved investments in digital infrastructure and IT systems to facilitate students' virtual learning experience. Many schools delivered IT resources (internet hotspots, laptops, and webcams) to students who did not have them for remote learning. Universities also conducted frequent assessments to systematize best practices and create solutions better suited to students' needs.

Online learning allows more flexibility and greater accessibility. It can create a more enriched learning experience by bringing in different expertise, experience, and views since professors can log into a virtual platform from anywhere in the world to participate in a class. However, there is a recurring concern about the impacts of online education on soft skills development and the potential for mental health degradation resulting from the lack of face-to-face interactions.

The pandemic's disruptive effects in the higher education sector and the quick transition to online education convinced many university leaders that change is overdue. Universities need to adjust their models and rethink academic program creation, delivery, and assessment to suit a changing society in which technology can enable a greater diversity in education and training options. During this process of deep change, it is important to note that a real digital transformation must go beyond just using video conferencing tools for education content delivery. It depends on developing innovative learning spaces and transforming pedagogy for remote learning.

Conclusion

Early recognition is the key to an effective response to the COVID-19 pandemic. Ignorance, denial, or delayed recognition by authorities or the public would exacerbate the situation. Due to the cascading impact of the pandemic, control measures need efforts of multi-sector collaborations, including the government, academic and research institutions, and businesses. The pandemic and its control measures spurred an increase in innovations. These innovative solutions came with both opportunities and challenges. In addition, there is still a gap in how to enhance preparedness and public awareness in times of crisis. One of the possible solutions is to investigate the sustainability of innovation so we can build resilience to better prepare for future crises.

About the Driving Innovation in Times of Crisis Initiative

The DITC is a multidisciplinary, multi-stakeholder, global initiative to advance the understanding of crisis and harness its potential to generate innovation and promote prosperity. The project started in 2022 with funding and support from our member Japan Science and Technology Agency (JST).

Since then, we have engaged in relevant discussions, unveiling historical moments when innovation flourished in the face of adversity to gather lessons and review solutions. [We invite you to check our report documenting all discussions held in 2022.](#)

In 2023, we onboarded two researchers working in organizations within our network: John Katsos, Ph.D. candidate at Queens University Belfast, and Ailun Gu, a postdoctoral research fellow at the University of Auckland.

They were responsible for collecting, comparing, and synthesizing existing crisis definitions, performing a literature review of crisis typologies and epistemologies, and mapping out relevant examples of crises.

They based their work on extensive academic research and a series of interviews with our members and fellows, which resulted in the publication of a white paper on crisis definitions and frameworks and three case studies, uncovering the 9/11 terrorist attacks, the COVID-19 pandemic, and the ongoing armed conflict in Ukraine. The latter was written by Denys Ilnytskyi, an academic from Kyiv National Economic University, which will be published shortly.

We thank JST for their continuous support, and we look forward to continuing our work to help individuals, businesses, and organizations develop new structures and capabilities to drive prosperity and innovation in times of crisis.

We firmly believe that while a crisis can threaten competitiveness, it also poses numerous opportunities. We want to provide a framework for stakeholders to navigate turbulence, limiting competitiveness losses while enhancing their potential to develop creative solutions and prosper.

For more information, visit our webpage:

<https://www.thegfcc.org/driving-innovation-in-times-of-crisis>

If you want to join us for the journey, please contact:

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