

# Virtual Education and Commerce: Resilience and Adaptation after the Pandemic and Earthquakes in Puerto Rico

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## Abstract

This article investigates the transformative impact of the pandemic on virtual education and commerce in Puerto Rico. The research examines the challenges and opportunities that arose from the dual crises of earthquakes and the pandemic. It aims to provide educators with practical tools to adapt to virtual environments and highlights strategies for strengthening the resilience of Puerto Rican businesses. Through this exploration, the research offers valuable insights into how both sectors can innovate and recover.

## Keywords

Business & Entrepreneurial Education, Economy, Commerce, Crisis, Inspiration, Virtual Education, Resilience, Innovation

## 1. Introduction

The COVID-19 pandemic and recurring earthquakes have exposed vulnerabilities in Puerto Rico's education and commerce sectors, particularly in their ability to adapt to rapid changes. While online education and business innovations offered solutions, they also revealed significant gaps in preparedness, especially for educators and entrepreneurs. Previous studies have addressed the individual impacts of the pandemic and natural disasters, but little research has explored their combined effect on education and commerce in Puerto Rico. This article aims to fill that gap by providing strategies for resilience and adaptation in these sectors, offering educators and business leaders actionable insights for overcoming current and future crises. The educational sector was one of the hardest hits by these combined crises. Many schools were damaged by the earthquakes, leading to prolonged closures. When the pandemic struck, the transition to virtual education

became the only viable solution to continue learning. This sudden shift presented significant challenges, as many educators were unprepared for the demands of online teaching. Despite these obstacles, the resilience demonstrated by both teachers and students became a beacon of hope. The forced adaptation revealed both the vulnerabilities of the traditional education system and the potential of virtual platforms to bridge gaps in learning continuity during times of crisis.

## 2. Seismic Network and Geology

The University of Puerto Rico's Seismic Network was pivotal in monitoring the continuous seismic activity after the December 2019 earthquakes. The network's real-time data and broadcasts provided essential information to the public, helping to mitigate fear and coordinate response efforts. However, the tremors not only affected physical infrastructure but also had severe implications for education and commerce. Schools were closed for months, delaying the start of the academic year, while local businesses, particularly in tourism hotspots like La Parguera, suffered significant financial losses. The combination of seismic activity and the ensuing COVID-19 lockdowns created a compounded crisis, highlighting the interconnectedness of geology, education, and economic stability in Puerto Rico.

## 3. Virtual Education

During the pandemic, virtual education became the only option to continue the educational process, revealing both the challenges and opportunities it offers. Educational institutions were forced to adapt quickly to this modality, and while they initially faced difficulties, inspiring examples of adaptation and success also emerged. A notable case is that of the University of Puerto Rico, which, in March 2020, made the urgent decision to cancel in-person classes and move them online. Jorge Haddock, the university's president, led this transition, and although there was uncertainty at first, the commitment of the faculty to ensure that students completed the semester amidst the emergency was exemplary. The university rapidly implemented technological tools and provided training for professors to manage the new platforms.

One standout story is that of a professor who, before the pandemic, had minimal experience with online teaching. Faced with the need to move her classes to a virtual format, she immersed herself in training courses and sought online resources to improve her skills. Through her dedication, she was able to create an online learning environment that not only kept her students engaged but also earned praise for her ability to maintain interaction and enthusiasm in her classes.

From the student's side, the experience of a senior business administration student illustrates how virtual education can be a challenge but also an opportunity. The student initially struggled to adapt to online classes, but the flexibility of the format allowed him to better manage his time and balance his work responsibilities with his studies. As he became more familiar with technological tools and

developed new self-organization skills, he found that online education offered him a new perspective and skills that could be valuable in his future professional career. However, not all stories are of immediate success. Many teachers and students faced significant obstacles, such as technical issues, lack of access to adequate resources, and difficulties adapting to new forms of teaching and learning. The frustration of educators who refused to prepare for virtual education was reflected in the difficulty of maintaining educational quality, leading to a decline in student satisfaction and graduation rates.

The impact of virtual education in Puerto Rico highlights the need for continuous preparation and an open mindset to face future challenges. The forced transition to online education has demonstrated that while technology can present obstacles, it also offers opportunities to innovate and enhance teaching and learning in times of crisis.

#### **4. Commerce Decline Due to the Pandemic**

According to the Monthly Economic Report of the Puerto Rico **Planning Board (2020)**, published in July 2020 (vol. 4, No. 7, available at [estadisticas.pr](http://estadisticas.pr)), “COVID-19 created a worldwide economic paralysis due to its high danger.” Despite the severe health crisis, there was economic growth of 1.5% at the end of 2019 and a 4.4% increase in gross product, which had a positive impact. This growth is attributed to the influx of federal funds and insurance payments due to hurricanes, providing temporary relief to the local economy. However, the report also highlights factors that could negatively affect Puerto Rico’s national economy, such as natural events (hurricanes, earthquakes, etc.), ongoing emigration, delays in federal aid and insurance claims, the economic stability of the United States, fluctuations in oil prices, and decisions by the Federal Congress on economic stimulus, among others.

A critical aspect highlighted in the report is the high poverty rate among families headed by women with children under 18 years of age. In Puerto Rico, families with female heads of household without a partner have a poverty rate ranging between 58.7% and 74.7%, compared to 28% for married couples. This scenario underscores the persistence of an economic crisis that deeply affects the social and economic development of the country. The question arises: How is it possible that with so much technological development, the country finds itself in this economic situation? And regarding this reality, how is the proliferation of factors that threaten the concept of family and marriage allowed? What can students do to develop ideas that help these vulnerable families out of poverty?

According to the Economic Studies Center of the Economic Development Bank for Puerto Rico, in its 2021 economic summary, “The commercial sector still shows signs of fragility after the restrictive measures to stop the spread of COVID-19.” This raises a crucial question: What can the Puerto Rican government do to support the commercial sector? What ideas can students, professors, and other actors develop to promote government actions that strengthen the national economy?

The Office of the Comptroller of the Government of Puerto Rico reports that “The economic cost of COVID-19 has caused a \$7627.2 million reduction in final demand” (Pelatti, 2022). The data indicates that the executive orders to stop the spread of the virus caused significant restrictions in the public and private sectors, resulting in a 12.9% decrease in the Gross National Product at constant prices until June 30, 2021 (Pelatti, 2022). Additionally, the restrictions led to a reduction of \$21420.6 million in production and the loss of 164,104 jobs. Forty-six percent of the decline in production occurred in the services sector, with a decrease of \$9906.3 million, followed by manufacturing with a reduction of \$5815.3 million. Together, these two sectors and commerce accounted for 81% of the total losses.

The Monthly Economic Report of the Planning Board considers the measures taken in the executive orders but does not evaluate the consumer response or the actions taken by businesses to adapt to these measures. Neither are the economic stimuli, both state and federal, designed to mitigate the damages included.

## 5. Among the Economic Stimuli Implemented Are

- PUA (Pandemic Unemployment Assistance): Pandemic Unemployment Assistance.

- CARES Act: The Coronavirus Aid, Relief, and Economic Security Act, a \$2.2 trillion economic stimulus bill passed by the United States Congress and signed into law by President Donald Trump on March 27, 2020, to address the economic consequences of the pandemic. These efforts seek to provide relief to individuals and merchants, although the total impact of the pandemic remains significant.

### Business Educators

Despite economic stimuli, the crisis in the economy and education persists. Many teachers and university professors never imagined they would have to adapt all their classes to a completely online format so quickly. In her article “Attitude Towards Online Courses: Key to Success as a Virtual Professional,” published in volume 32 of the APEC journal (Quiñones Bracero, 2019), the author warned about the need for business educators to prepare for virtual education. No one anticipated the magnitude of the crisis that would require doubling efforts to prepare the youth to revitalize the economy, which is in dire need.

According to the book “Fundamentals and Methodology for Learning Typing in the Digital Era” (2012: p. 4), the NBEA (National Business Education Association) and the EBEA (Eastern Business Education Association) expected that by 2020, Commercial Education would have three fundamental purposes: 1) education for commerce, 2) education about commerce, and 3) education in commerce.

Business educators can assign students to research and write about the economic impact of the crisis in Puerto Rico. What happened to commerce during the pandemic? What were the causes and consequences? What has happened since then? Additionally, what do they suggest to reactivate the economy? The education of this new generation can play a crucial role in preventing and preparing for future similar crises. Students can also investigate the percentage of jobs lost and

the percentage of people who emigrated from Puerto Rico. Even in psychosocial courses, students could research the emotional impact of these events, such as the percentage of people who developed anxiety or other conditions related to the crisis. Finally, a bill could be developed to encourage students to contribute to Puerto Rico's economy and incentivize them to stay on the island to achieve their professional development.

During the total lockdown due to the coronavirus, under martial law, without the possibility of attending schools, colleges, universities, or even working, the ideal moment arose to implement online classes and keep students active. However, how could this be done if many teachers had previously resisted training or preparing to teach online courses? Some teachers suffer from technophobia, while others simply do not want to leave their comfort zone and prefer face-to-face teaching. It is estimated that by the end of 2021, many students had fallen behind in their studies, and some may never complete what they started. This hurts educational institutions in terms of enrollment and graduation rates, which in turn negatively impacts Puerto Rico's future economy.

The pandemic has accelerated the need for rapid adaptation in education, especially for business educators. With the forced transition to online teaching, many teachers faced unexpected challenges, from a lack of preparation to resistance to adopting new technologies. However, this context offers a unique opportunity to reinvent and strengthen education in the business field, adapting it to future needs and ensuring that the next generation is better prepared to face the economic and social challenges that may arise.

## **6. Practical Strategies for Business Educators; Recommended Digital Tools**

**Learning Management Systems (LMS):** Tools like Moodle, Blackboard, and Canvas allow teachers to organize courses, distribute materials, and assess student progress.

**Video Conferencing Software:** Platforms like Zoom, Microsoft Teams, and Google Meet, among others, are essential for conducting virtual classes and maintaining real-time interaction.

**Collaboration Applications:** Tools like Slack and Trello facilitate student collaboration and group project management.

**Innovative Teaching Techniques:**

**Project-Based Learning:** Implementing practical projects that simulate real business situations helps students apply concepts in real-world contexts.

**Gamification:** Incorporating game elements into lessons, such as competitions and challenges, can increase student motivation and engagement.

**Flipped Classroom:** Allowing students to study materials at home and using class time for discussions and practical applications enhances understanding and active learning.

**Additional Resources:**

Webinars and Online Courses: Participating in additional training and online conferences can provide educators with new perspectives and techniques for virtual teaching.

Digital Libraries and Open Educational Resources (OER): Utilizing online educational resources can enrich course content and offer additional material to students.

Interviews and Testimonials:

Including interviews with online education experts and educators who have successfully managed the transition can provide valuable insights and practical advice. These testimonials can highlight how they overcame obstacles, adapted their methods, and supported their students during the transition process.

Business educators face a significant challenge in adapting to virtual teaching. However, with effective strategies, the right tools, and a proactive approach, it is possible not only to overcome these challenges but also to transform business education to better prepare for the future. Preparation and innovation will be key to equipping the next generation of business leaders in an increasingly digital world.

## 7. University of Puerto Rico

On March 13, 2020, University of Puerto Rico President Jorge Haddock announced the cancellation of in-person classes via email. Between March 16 and 23, 2020, faculty members faced the challenge of transforming their face-to-face courses into online, technology-assisted modalities. The primary goal was to ensure that students could complete the academic semester amid the COVID-19 emergency. At that time, only 17 suspected COVID-19 cases had been reported in Puerto Rico, but the World Health Organization had declared COVID-19 a pandemic. This context highlighted the urgency of preparing educators for online teaching, as emphasized in the article “Attitude Towards Online Courses” (Quiñones Bracero, 2019). The article stressed that the attitude and disposition of teachers towards online courses were crucial. It also warned that “teachers with many years of experience could fall behind or lose their jobs if they were not willing to update their technological knowledge and adapt to changes in teaching-learning processes and tools” (p. 283).

The analysis of the forced transition to online education reveals that many educational institutions were forced to adapt quickly, impacting numerous students. The online modality, which is here to stay, exposed some educators’ lack of preparation and the frustration it generated among both students and parents, who often had to assist with schoolwork. Since 2021, the University of Puerto Rico’s Business Department has assumed even greater responsibility for training new students. Additional efforts are required to revitalize the national and global economy, demanding students with strong business and economic skills. The need for trained entrepreneurs, focused managers, and efficient administrative assistants is crucial to achieving the country’s goals.

The pandemic, along with other natural disasters, has severely affected

commerce, the economy, tourism, and education. To rebuild a better Puerto Rico, it is essential to educate students with solid foundations, maintain strong convictions, and perhaps incorporate a little faith and hope to achieve the proposed goals. According to leadership expert John Maxwell, as cited in the book “Successful Women Speak Differently” (Burton, 2018: p. 30), “The most successful people make wise decisions early in life and execute those decisions for the rest of their lives.” Therefore, it is essential to educate and train students with determination to make wise decisions and establish correct habits from an early age; students with both short- and long-term aspirations and goals.

## 8. Conclusion

Education and commerce in Puerto Rico have faced unprecedented challenges due to the dual crises of the pandemic and recurring earthquakes. However, through resilience, adaptation, and innovation, these sectors can recover and thrive. Educators must focus on fostering discipline, motivation, and effective organizational habits in students, equipping them to navigate crises and contribute meaningfully to the economy. Similarly, businesses must embrace new strategies for sustainability in a rapidly changing environment.

To achieve this, individuals and institutions should prioritize the following:

- Focus on clear goals and avoid distractions.
- Cultivate resilience through preparation and adaptability.
- Embrace continuous learning and personal development.

As the biblical passage, Hosea 4:6 reminds us, “My people perish for lack of knowledge.” Puerto Rico’s future depends on the education of its people and their willingness to innovate and persevere in the face of adversity. With strong foundations, clear convictions, and a commitment to progress, Puerto Rico can rebuild a more prosperous and resilient future.

## Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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