Online Education in a Pandemic: Stress Test or Fortuitous Disruption?

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Abstract. This study explores higher education and the ways in which the shutdown caused by the COVID-19 pandemic have accelerated the evolution of online education. This movement from face-to-face (F2F) education to a virtual environment was forced and unplanned. It can be viewed as a stress test for digital teaching and learning in the higher education system. The study addresses course conversions and the progress of online education in response to the current crisis.

Introduction

The COVID-19 pandemic has caused a seismic shift in the world of online education. Our nation is constantly dealing with crises. The pandemic is not just a health crisis; it has touched every walk of life, including higher education. The pandemic has become a stress test for digital learning and teaching in higher education, comparable to the banking stress test that was an outcome of the financial crisis of 2007–2008.

The pathway to course creation should begin online. A robust online course would already have in place an educational program that could logistically be taught in any environment. From there, it could be converted to face-to-face (F2F) instruction by keeping or removing components, such as the technology, that would have already been incorporated into the original digital version. The F2F version could still be delivered even if the technology became temporarily unavailable.

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If course delivery circumstances need to completely change, as they have because of the pandemic, there would already be an established online version. Changing circumstances do not have to be as dire as a global pandemic. Personal and life-changing situations would allow the learner or instructor to participate from a distance.

This study concludes with two considerations: the ramifications of the aforementioned stress test as a possibly fortuitous disruption in education and the fear that this disruption might prove to be a less meaningful catalyst than anticipated.¹

The stress test for online education triggered by the pandemic is unlike the 2007–2008 financial crisis, which culminated in the creation of a stress test on the banks, insurance companies, and other financial institutions. The greatest contrast between the two scenarios is that the financial crisis was of its own making, whereas the coronavirus was an external factor in the creation of this crisis in online education.

To make this analogy, it should be understood that our summary is in no way meant to define the financial crisis or to document the evolution of the pandemic as a global crisis.

The goal of our observations is to shed light on why this pandemic has impacted the education system so differently than other epidemics. Will this disruption in education be remembered as an integral part of the pandemic? Will the disruption in education have lasting personal impacts? Will March 13, 2020, when President Trump declared a national emergency, be a defining moment in education? Will education have evolved in any meaningful way because of the pandemic?

The Education System Has Never Shut Down

COVID-19 has led to many crises in the United States. There have been state closures of many physical institutions. Much like other sectors that were completely closed by shelter-in-place orders, most of the physical spaces for education were vacated. Most notably, the education system was never shut down; instead, it shifted. Education moved online to ensure continuity. With the foremost concern being health and safety, education appeared to be all in: “Education does indeed tend to solve its issues by appearing to be resolute and institutionally steadfast” (Elliot 2020).
Online Education in a Pandemic

Historic Background

There were two earlier epidemics in the 20th and 21st centuries, during which higher education played a role: the pandemic flu of 1918 and the outbreak of H1N1 (swine flu) in 2009. During both epidemics, institutions of higher education (IHEs) were able to contain the viruses on campuses and maintain continuity of education. During these previous epidemics, student populations were smaller. Self-isolation on campus was possible, and classes continued safely through restructuring and by adding a distance-learning component (Lovegrove et al. 2020). Cozens (2020) also points out that morale played a factor in 1918. At that time, many citizens were serving in WWI. Their sacrifices overshadowed the sacrifices required by those whose education was inconvenienced.

In 2009, the Centers for Disease Control (CDC) created guidelines for IHEs to follow in the event of a pandemic. Unfortunately, the H1N1 influenza virus hit before most plans were solidified. Kimball-Baker et al. (2010) used the collaborative effort among the Big Ten universities2 as an example to explain how the virus was contained on campuses. These institutions already had an alliance through sports. The Big Ten decided that the broad recommendations provided by the World Health Organization (WHO) did not apply everywhere. Swine flu (H1N1) was spreading rapidly and targeting the college demographic of adults under the age of 24. It needed to be handled locally because the numbers in the United States did not necessarily match what was being reported globally. The H1N1 virus was managed with an abundance of caution and was contained within most campuses and controlled by the institutions. Very few institutions needed to shut down (Kimball-Baker et al. 2010).

According to Kimball-Baker et al. (2010), the main reason for success was the high engagement of students. Medical students and student nurses helped the overwhelmed clinics. Other students were tasked with communicating to the campus community how easily the H1N1 virus could spread and what hygiene measures they should practice to avoid infection. Much of student response was motivated by the awareness that if the institution needed to shut down, it would cause academic disaster for certain students. They would never recover their chance to have an academic career (Illanes 2020).
As a result, U.S. colleges and universities were encouraged to develop pandemic response plans (including plans for a respiratory pandemic) long before the appearance of COVID-19. There were recommendations to create a pandemic response team, to develop multiple options for different outbreak scenarios based on the severity of the illness, and to determine how to close the campus, if necessary, including continuity of instruction policies such as online education (Carlton 2020).

None of these pandemic responses included government mandates since there are few federal regulations for higher education. Individual institutions normally decide whether to close for a certain period if there is a localized outbreak of any virus, such as ordinary flu, once the infected population reaches a determined percentage.

*The Bank Stress Test*

We compare the response of the higher education system to this epidemic disease with the national response to the financial crisis. Some of the outcomes of that financial crisis were new regulations such as the Dodd-Frank Wall Street Reform, the Volker Rule, and the Consumer Protection Act. The goals of these reforms were to restructure the banking system, rebuild the economy, and rebuild trust in financial institutions. The most important outcome of the financial crisis was the creation of the “bank stress test.”

A stress test is a performance assessment, sometimes used proactively to aid preparation and help recognize potential problems before crises hit. A stress test identifies strengths and weaknesses and pinpoints where systems are meeting expectations or need improvement. By performing such a test, a system can be built with integrity, and, ideally, it can withstand the forces exerted on it each day. A stress test can ensure reliability.

Based on this comparison with banking, we will examine whether online education has been proactive, has demonstrated preparedness, has recognized problems as soon as possible, or has determined where it needs improvement. At this time, we cannot determine if our education system is reliable and if it will withstand the forces exerted on it in the future.
The bank stress test was designed by the U.S. Federal Reserve and the International Money Fund to assess whether banks had sufficient capital to withstand hypothetical adverse economic developments. The stress test caused by the acceleration of education online is not hypothetical. Real-time adverse nationwide conditions will decide if the education system can meet expectations.

There Are No Nationwide Historical Scenarios for Education

Between the 2009 H1N1 pandemic and the COVID-19 health crisis, which was declared in March 2020, the CDC posted guidelines for IHEs in the event of another epidemic (CDC 2010). Besides recommending strategies for health and safety, there were also guidelines for two academic factors: preparing for the possible need for class suspension and ensuring that students could continue to learn. Guidelines were updated in 2017 by the American College Health Association (ACHA), and academic affairs were also addressed. One guideline was to develop and disseminate alternative procedures for completing coursework such as through web-based instruction or lessons and assignments delivered by mail (ACHA 2017).

Neither the CDC nor the ACHA anticipated a nationwide emergency. They did not anticipate that all students would need to vacate their campuses, and it was not possible to address the aforementioned “alternative procedures for completing coursework” under these circumstances. The guidelines were for campus emergencies or temporary emergencies at best. Even if each IHE had followed the chains of command, the emergency procedures did not anticipate the extent or the duration of the COVID-19 pandemic.

COVID-19 is no ordinary flu and IHEs were not prepared for this unprecedented nationwide shutdown.

Moving Online

Preparedness means more than just conceptualizing a plan. Preparedness, at a minimum, involves having a plan that is ready to be implemented. An IHE that created online courses was in better shape for implementation, but preparedness is also testing that plan to see if it could be put into practice.
Institutions of higher education did not have a proactive approach for a nationwide event of the magnitude of COVID-19 based on CDC and ACHA guidelines. The only recourse was to be reactive. In terms of the stress test, it could be said that the continuing evolution in online education is what has met expectations and has allowed continuity of education. This pandemic identified the strengths and weaknesses of the IHE online education programs. Institutions started to pinpoint where their programs needed improvements. By the end of spring 2020, the groundwork had been laid for the conversion of all face-to-face (F2F) courses to online instruction. Because of the immediacy, these online courses may not have been ideal, but many investments had already been made to launch a new plan of preparedness.

It is interesting to note that the innovation of the technological instruments that gave the financial system the capacity to create its own crisis also allowed it to move many of its services online in the subsequent decade. Institutions of higher education had the same amount of time and many services are now digital, but learning and teaching online continue to meet resistance.

A comparison of theories about the factors that led to the financial crisis and theories about the spread of the virus and the handling of its containment is irrelevant to this documentary study of the crisis in online education. What is relevant are the similarities between what both crises revealed.

Revelations

The financial crisis revealed a lack of oversight (Singh 2020). Banks had begun to use exceptionally low introductory interest rates to give mortgages to people with weak credit histories. When the rates reverted to the prevailing level, people could no longer afford their loans. There were foreclosures, and banks were left with trillions of dollars of debt. Some banks were going to fail or be sold to other banks or to the government. It was revealed that the banks and financial institutions were severely undercapitalized and lacked the money or insurance to cover the losses from mortgage defaults.

The financial crisis also revealed growing income inequality, and, because of these inequities, families had also been encouraged to
increase their household debt to maintain their desired living standard, which, in turn, led to a credit crisis (Dash 2008). These mortgage and credit practices represent only two of the many factors that led to the financial crisis.

The response to the COVID-19 pandemic shutdown revealed a lack of preparedness on the part of educational institutions to move learning online. Preparedness can be defined on many levels for the institutions as well as for the faculty. Many lacked preparedness to go online for the first time. Others were not prepared to go fully online. The support that was needed from information technology (IT) and instructional designers (IDs) was not commensurate with the degree of acceleration. The faculty had to make do with the support personnel who were already available. Some programs that had a completely online presence shared their IDs (Bulkley 2020). Lack of preparedness also meant that the technology was available but was probably never in full use. As Elliot (2020) explained:

In reality, the allocation of resources in education is fluid and contingent on social circumstances. The appearance of “having” [capacity] is quite different from the observed “actions.”

Inequities similar to those of the financial crisis were revealed across the student population, not only among people of color, who have been disproportionately affected by the virus. Off campus, too, the inequities called attention to other groups that were underserved economically, geographically, and technologically, where the infrastructure simply did not exist. For example, many rural areas not only lack broadband Internet but also cannot get a cellphone signal, prohibiting access to wireless hotspots.

There were revelations about the number of students relying on services that were suddenly no longer available to them, including access to housing and meals, access to technology, and tuition reduction. The pandemic has highlighted, to an even greater extent, the severity of the “digital divide.” One administrator spoke about discovering that students were parked in their cars on campus in order to access the wireless Internet services they needed to complete their coursework (Rabner 2020). For students who were housing- or
food-insecure, campus closures exacerbated these issues, and many struggled to find alternatives. Eddy Conroy, associate director of research communications for the Hope Center for College, Community, and Justice, told CNBC:

The long-term effects are kind of hard to know, but in general, when you have vulnerable populations and emergency hits them, it tends to make their life situation worse. Just as a sort of general statement. And so, I think overall, that’s what we’re going to see. … If colleges don’t figure out how to support those students, they might lose them permanently. (Hess 2020)

Part of being an educator is the acceptance of dealing with new issues as they arise. Having to convert F2F classes to a virtual environment in 2020 revealed lack of training and the inability of some instructors to use the technology that would allow them to teach their courses effectively online.

Students who had never been enrolled in an online course were not prepared to learn remotely and struggled in this new environment. One reason is that a typical course load is 15 credits, but a workload of that magnitude became intense when it was done online and most likely contributed to some of the recent negative reactions to learning in a virtual environment. The learners did not realize that this workload online was not considered to be the norm. Time self-management when learning online required discipline. Under the new circumstances, it was more important than ever to stay on task.

One question that remains unanswered concerns the mode that was used to shift to online education. Due to the need to self-isolate, there were only two choices. If the shift was to synchronous online education, then the learners could still follow their F2F schedule. Synchronous learners would meet at their normal class time and the course would be live online. They could complete their assignments as they would normally.

If the instructor decided to use the asynchronous mode, then learners required more self-discipline. Asynchronous learners choose when to access the course and complete their work. Without good time self-management, the workload could create a bottleneck. Since higher education classes meet between one and three times a week, it is
possible that the instructor taught synchronously and asynchronously, which made the course hybrid. In this scenario, it was necessary to keep track of which part was being done synchronously and the parts that could be done at the learner’s convenience.

Convenience, ironically, could become the learner’s worst enemy. A hybrid or asynchronous format required students to simulate the habit of going to class at the appropriate time while doing other required course work at their convenience. The instructor should have been available during the class hour as well as during online office hours at his or her normally scheduled time. Staying in the routine would have made for a more normal transition to an environment that may not have felt normal. Some students who found themselves struggling academically for the very first time were terrified that classes would reopen remotely in the fall and did not want to experience that struggle again. There was talk about students taking a gap-semester. There were also students who had already been struggling in F2F classes, and online learning may have increased that struggle.

**Well-Constructed Online Courses: Lessons from the Pandemic**

A well-built online course, just like a good F2F course, begins with a good design process. This phase is generally a collaboration between a faculty member and an instructional designer (ID), with the cooperation of the information technology (IT) department. IT is responsible for backend support of networks, validating the interoperability and compatibility of enterprise software. The IT department should conduct the “stress tests” on course hardware and software. Administrators, together with IT, typically create a “shell” course in the learning management system (LMS) using a template that has been adopted by the department, school, or college within the institution.

*Many institutions did not have a robust learning management system, enough instructional designers, or enough support from IT to conduct stress tests or ensure a smooth course design process.*

Faculty and designers place course content in the shell. Using this course template gives a consistent user experience (UX) for students and is sometimes used to brand courses in a program, department, or school within the IHE. Though this framework does not contain any
pedagogy, a well-planned shell can suggest content that would lead to a better online course. It can provide logical navigation through the course content. For example, if the course follows a weekly or unit structure, each unit can include discussion forums, placeholders for assignments, readings, and assessments. Many institutions use rubrics, such as the one provided by Quality Matters (qualitymatters.org), to build a course. They act as a checklist of standards for good pedagogical practices. They evaluate whether the course contains an overview, stated learning objectives, activities that encourage learner interaction, information about the necessary course technology, and learner support services.

During the pandemic, many of the F2F classes that needed to be moved were not designed using the framework of the course shell.

The instructional designer, working within a well-designed template, can ensure that these elements are properly addressed. Two standards that are often overlooked are accessibility and usability. F2F courses need to comply with the Americans with Disabilities Act (ADA). Online courses require more work to meet the law and are more likely to be scrutinized for compliance.

Designing with accessibility standards not only benefits students with disabilities but also students who are English-language learners. Providing multiple methods for learners to access knowledge, to demonstrate their understanding, and to engage with the coursework, instructor, and other students is a process by which accessibility and usability can benefit all participants. Requiring online videos to have captioning and a text transcript assists learners with sight or hearing impairments but may also benefit all students. Captioning has become a standard feature even for commercial television and streaming services.

It could have been difficult to meet the accessibility and usability requirements due to time constraints.

The instructional designer (ID) provides a design roadmap, a timeline for developing guidelines for the creation of the course components, testing of user experiences, and, oftentimes, the necessary training for instructors and, possibly, for learners as well. Functional users might also test the components. Their feedback to designers and instructors might require making modifications. This is best done,
when time allows, before the course is tested in real time by students during the semester. The department chairs might need to highlight the expertise of the ID in order to instill confidence in faculty who are unfamiliar with instructional design theory.

The courses were real-world tested without time for feedback and modifications, though issues may have been addressed while the course was in progress.

Content delivery is a critical part of course success in both F2F and online environments. In a traditional F2F classroom, the delivery is very much dependent on the instructor. The delivery of content in online courses is more student-centered. A F2F lecture delivered interactively with questions and answers is different from a well-planned and edited version on video. In the early days of online education, it was quickly discovered that a 90-minute lecture that might be tolerated in a classroom did not work as a recording. Students would divide the lecture into smaller parts and fast-forward when bored. Designers quickly began to have instructors divide content into mini-lectures with other activities between multiple sections. The recorded lecture still has a place and offers some advantages, such as allowing students to review it and allowing instructors the opportunity to polish the presentation so it will have a shelf life beyond a single semester.

Faculty who were new to teaching online may have struggled with methods that would make content student-centered. Difficulties were compounded by a lack of familiarity with the technology.

Because of the rush in moving courses online, the public reacted negatively to courses that lacked the key components of a well-designed online course. We acknowledge that not all faculty who design online courses have access to instructional designers and services. They may not even begin with a well-built course shell and template. Unfortunately, this can lead to poorly designed courses that not only make learning inefficient and difficult, but also hurt the reputation of the instructor, department, college, and online learning in general.

Institutions may have resorted to pre-built online-learning platforms without enough time to determine the quality.

Textbook publishers now provide course solutions as well as entire online learning platforms. Because of the lack of instructional design
support, some higher education administrators viewed these online courses that are pre-built around a textbook and support materials as an easier way to achieve consistency in design and pedagogy. Faculty, on the other hand, could see this approach as limiting their intellectual freedom. There are institutions that allow faculty to change a provided course shell or pre-built course as they see fit, but there are others that “lock down” courses to prevent changes. The latter is often the case with courses that have multiple sections because they are taught by adjunct faculty.

*HyFlex*

The mode of delivery recently labeled HyFlex (also known as converged learning) is the most comprehensive and most challenging modality for the instructor and the designer. In its purest form, HyFlex offers students the option to select how to attend each class session. A student can come to a F2F classroom session or participate synchronously with that class at a distance. The third option is to be fully online using the recorded F2F session asynchronously. Learners can switch modalities from week to week or even from day to day. A student may choose to attend the class online one day during a particular week, but then attend in-person for the next session. A student who has no access to campus could choose to attend synchronously to have the opportunity to participate online, but also have the choice to be asynchronous for the next session because of a schedule conflict. It allows the most latitude for participants. If the instructor cannot attend the F2F class, students can still convene in their classroom and interact with the instructor who needs to work remotely. But most important is that each modality of HyFlex must strive for the same degree of equivalency.

The concept of the converged classroom goes back to at least 2013. Its flexibility was intended to help with job and family commitments and provide consistent course content (Wiles and Ball 2013). It was also designed to promote more student interaction and engagement and support multiple intelligences and learning styles. Pandemics and shutdowns were not considerations in that early concept, but they have become major reasons why the multimodal approaches are all being considered moving forward.
This three-pronged approach requires additional technology for live streaming and recording the class including its interactions. Though this can be done with videoconferencing software packages and simple laptop webcams, some schools have reconfigured entire spaces intended for converged learning by adding more sophisticated hardware and support staff. These classrooms and this mode of delivery are often reserved for courses that benefit more from the F2F element, but even converged learning still requires a good online-course design as a starting point.

In any modality, and to be prepared for any event, it is imperative to build an online course first. If an institution were to offer both an online and F2F section of the same course, this workflow from the online version to the F2F version would be more efficient. This pathway could have averted some problems caused by the shutdown, where institutions and instructors needed to start from the beginning to get content online and learn to work with technology that they had not been using.

**Online and HyFlex Pedagogy**

There has been no shortage of publications in 2020 about good pedagogy in a virtual environment. Teaching online is a new pedagogy but these recommendations encompass the same good pedagogy that has evolved over years of studying and understanding learning processes and are already implemented in good F2F classes.

Pedagogy is the method and practice of teaching based in the field of psychology. It requires recognizing that there are multiple intelligences and that learners draw from multiple resources. Courses presented with multiple strategies allow students to better orchestrate their own learning. Any degree of ownership of their learning processes and the ability to tailor the curriculum to their learning needs increases engagement and optimizes their capacity to learn. This shift to student-centered responsibility is important online. This does not free the instructor entirely from monitoring student progress. In fact, new online learners often fail because these responsibilities, such as time self-management, are not ones they have experienced to the same degree in traditional courses that were instructor-centered. One instructor, when talking
about this new engagement responsibility, made the analogy between forcing a person to eat and forcing a person to learn. Both are unpleasant and undesirable; the preference is for the person to come to it on his or her own (Fernandez Poyatos 2020). New online learners during the pandemic may have struggled with these new responsibilities.

We both came to higher education from secondary schools with degrees in education and training in pedagogy. In higher education, we found that some instructors were quite willing to admit that they lacked that training, and some of the best instructors wanted to learn more about methods of teaching and learning. Institutions of higher education often offer professional development in pedagogy but with the caveat that, unlike lower schools, they cannot require faculty to participate, as it is not part of their contracts. At one institution, the provider of the learning management system offered free training for instructors throughout the summer, but only one instructor enrolled (Leopold 2020).

As much as we contend that there are many pedagogical similarities between online and F2F education, there are a few learning principles that are unique to e-learning. The electronic modes of delivery certainly change what content is used and how it is presented. Since the beginning of online-course offerings, it has been true that those that involve experiences, such as wet labs, are more difficult to make equivalent online. Throughout the pandemic, courses may not have been able to require field work. Classroom demonstrations and lectures, even when faithfully captured on video, may lack elements of engagement. This past year, many have commented that some virtual experiences, academic or otherwise, were “just not the same” as an in-person experience.

Conclusion

Some crises in higher education during the unique year of 2020 were due to lack of preparation and the speed with which the transition to online was made. The pandemic was an accelerant to crises that were present before 2020, such as decreasing enrollment, increasing costs to colleges and to students, inequities in access, and differences in quality and delivery of online and F2F courses.
Financial crises have resulted in legal changes requiring that banks be prepared for the next crisis and stress testing to monitor solvency. So far, nothing that sweeping has happened in education.

No one can predict the long-term impact of the pandemic on societies and economies in the years ahead, but we think it is likely that the disruption of education in 2020 in both higher education and K–12 schools will be felt for several years. High school seniors who graduated in 2020 or will graduate in 2021 will represent a different kind of college freshman. The slump in knowledge that occurs when students are away from the classroom for several months will certainly be magnified by a year or two of modified learning.

A number of lessons were learned from the pandemic about online learning. If an online course is built with integrity, meaning that it is well constructed using all of the design elements, it can be delivered using other modalities, including F2F. During the pandemic, students and faculty understood that they needed to become more digitally literate. They understood that technology is a way to integrate course content into their lives. Students did not see the abrupt movement to online education as an opportunity to learn differently. If there were doubts before, it became clear that there is a digital divide across the entire nation in terms of infrastructure and access to technology.

Higher education needs more than a reactive pandemic response. It needs to be prepared for the inevitable future instances of disruption in both the short term and the long term. Some observers have called the coronavirus a “black swan” moment—an unforeseen event that could change everything for higher education. Investments were made to shift education online, and that shift could be transformational. But we question whether the changes will be permanent, and if past is precedent, it still will be left up to the individual institutions.

Notes

1. For the purposes of this article, “online education” denotes higher education, and “lower schools” is the K–12 system, which is not the focal point in this study. “Instructor” replaces the word “teacher” in most cases since there are varying levels of distinction for faculty in higher education. When referring to online education, students may also be referred to as learners or participants.
2. Technically, they were the Big Ten + Two universities: University of Chicago, University of Michigan, Ohio State University, University of Illinois, Michigan State University, Pennsylvania State University, Indiana University, University of Minnesota, Purdue University, University of Iowa, Northwestern University, and University of Wisconsin.

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