

Disruption in Education

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OVER THE PAST 20 YEARS, tuition at our country's four-year colleges and universities has increased at a rate of almost 8 percent annually, more than double the rate of inflation over the same period.¹ Enrollment in four-year programs has grown at a snail-like rate of one-half percent over the past decade.² The United State's world-renowned higher education system faces a severe budgetary crisis at both the state and federal levels, and more than 500 institutions have closed their doors in the past decade.³ Meanwhile, distance learning and corporate universities are growing at meteoric rates. Enrollment in distance learning is growing at three times the pace of classroom-based programs and is expected to reach five million by 2005.⁴ Corporate training is a \$32 billion annual industry, with a reported 2,000 corporate universities in the United States.⁵ The growth in the number of corporate universities is explosive: there were roughly 400 such universities at the beginning of the 1990s.⁶ How can we reconcile the slow growth and struggles in one part of the education industry with explosive growth in another? The answer lies in the theory of disruptive innovation.

The theory of disruption can provide researchers, practitioners, and policy makers with a new perspective on increasingly affordable and accessible educational opportunities in our society. We view disruptive innovation as a dynamic form of industry change that unlocks tremendous gains in economic and social welfare. Disruption is the mechanism that ignites the true power of capitalism in two ways. First, it is the engine behind *creative destruction*, a term coined by Austrian economist Joseph Schumpeter in his classic work *Capitalism, Socialism, and Democracy*.⁷ Disruption allows relatively efficient producers to blossom and forces relatively inefficient producers to wither. This destruction, and the subsequent reallocation of resources, allows for the cycle of construction and destruction to begin anew, enhancing productivity, lowering consumer prices, and greatly increasing economic welfare. Our research indicates that the disruption-friendly environment of the United States is one of the principal drivers of its recent economic prosperity.⁸

The second way that disruption drives improved welfare is through *creative construction*. This is its real power. A disruptive company starts by creating a large, new growth opportunity, almost always by allowing a broader group of people to do things that only experts or the wealthy could do in the past. Convenience goes up, prices eventually drop, and consumption increases dramatically as a result of disruption. The new growth opportunities that disruptive companies spawn have historically been a primary source of improved consumer welfare. Industries characterized by high costs, variable quality,

and inefficient means of delivery—like health care, education, and legal services—have been largely shielded from the forces of disruption.

In this chapter, we highlight the key insights of our research on disruptive innovation; apply those insights to better understand how disruption is presently affecting education; and assess whether factors that appear to be threats to institutions of higher learning might instead be viewed as opportunities for society at large. More specifically, understanding the disruptive innovation theory will help leaders in the education industry better answer questions such as, Where is online learning most likely to succeed? What impact does corporate training have on postsecondary education programs? Are community colleges complementary to four-year programs, or do they present a disruptive opportunity?

The Disruptive Innovation Theory⁹

Disruption is a powerful force that has transformed numerous industries ranging from retailing to computers, and even to portions of the education industry. Companies create disruptive business models that utilize relatively simple innovations to compete in a new way in new markets away from established competitors. Stymied by their internal processes and resource-allocation criteria, leading firms often find it impossible to respond to disruptive attackers, which inexorably improve their products and ultimately cause powerful shifts in market

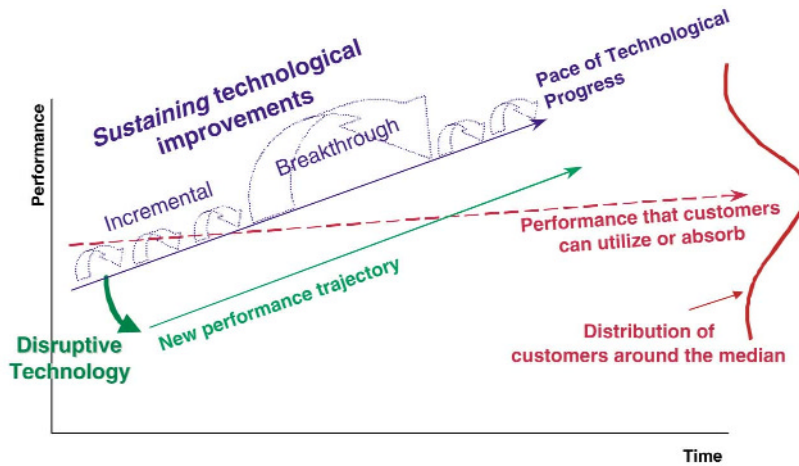


Figure 1. Definitions of sustaining and disruptive innovations.

share. As a result of this process, disruptive innovations break down the historical tradeoffs between access, cost, and performance.

The disruptive innovation theory asserts that there are two types of performance trajectories in every market. The first trajectory measures the improvement in a product or service that customers can absorb or utilize over time, as depicted by the gently sloping dotted line in Figure 1. The second trajectory, illustrated by the solid lines in the diagram, indicates a distinctly different pace of improvement that innovators provide as they introduce new and improved products.

Our research indicates that this second trajectory—the pace of technological innovation or progress—almost always outstrips the ability of customers in a given tier of the market to

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absorb those innovations. This outcome is predictable. Well-run firms always look for higher margin opportunities, which typically are captured by producing better products along dimensions that consumers historically value. These improved products are called “sustaining” innovations. Listening to their best customers, well-managed firms offer products and services that eventually outstrip the needs of the core market. This imbalance creates the potential for innovating companies to develop “disruptive” innovations—cheaper, simpler, more convenient products or services—and reach customers who are not well-served by the current offering.

As first discussed in *The Innovator's Dilemma*, good companies stumble when faced with disruptive innovations, not because their management teams are incompetent, but rather because they have great management teams that listen to their best customers.¹⁰ This is the innovator's dilemma. Almost always, the leading companies in industries where disruption occurs are so absorbed with the up-market innovations that enable them to address more sophisticated and profitable customers in the more demanding tiers of the market that they miss the disruptive innovations piercing the market from the low end. Market leaders almost always master sustaining innovations, whereas start-up ventures have a low likelihood of success if they attempt entry on an established sustaining trajectory. However, when innovations are encased in a disruptive business model, the entering firms have a significantly greater chance of gaining the upper hand. The incumbent's business model often cannot accommodate the disruptive innovation,

and the incumbent therefore is inclined to willingly give up ever-increasing amounts of market share. Ironically, the disruption often is in full flower before the incumbent players even realize their old game is in jeopardy. Because their over-served customers at the low end of their markets often are the least profitable to serve, the leading companies' profit margins typically increase as they focus on higher margin customers, even as they cede market share to the encroaching innovation coming from below. In other words, being disrupted usually feels good until it is too late for the leading companies to respond.

Identifying Disruptive Growth Opportunities

All disruptions are predicated on creating large growth opportunities away from the core of the incumbent's market. Companies seeking to build disruptive growth opportunities have one of two options (displayed in Figure 2). They can seek to *compete against non-consumption* and establish a completely new market, which we call a Type I disruption, or they can *compete from the low end* by deploying a business model that profitably serves less-demanding customers that market leaders are actually happy to shed, which is known as a Type II disruption.

Most disruptive innovations are Type I disruptions. Type I disruptions give a group of customers a relatively simple product or service that allows them to do something they could not do in the past because of lack of skills or money. In Figure 2, a Type I disruption occurs in a new application, away from an

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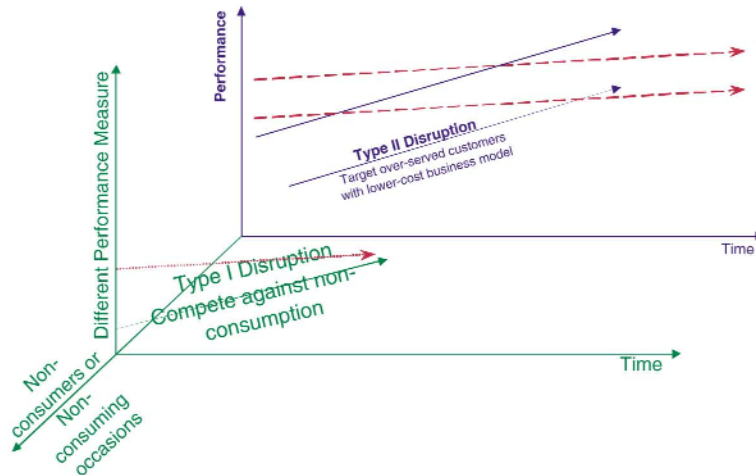


Figure 2. The two types of disruption.

established market, where users enjoy the benefit of the innovation within a new context. The telephone is a classic example of a Type I disruption. Prior to the introduction of the telephone, the only mechanism (aside from yelling) for real-time communication over any distance was a telegraph. Using a telegraph required the inconvenience of traveling (sometimes a great distance) to a central facility and working with an expert operator trained in Morse code. If the expert was not there (and you could not call ahead to check), there was no way for an untrained user to send an intelligible message. The telephone changed this paradigm. Anyone could use it simply by picking up the receiver. As more customers came onto the network, users simply had to ask an operator to connect the

call. It was easy to use and most likely even fun. Moreover, the telephone did not initially compete against the telegraph. The range of the original technology was limited to three miles, making it unsuitable for the job the telegraph was designed to do, that is, provide long-distance communication. Western Union, the dominant telegraph company, ignored the telephone because its best customers—railroads and banks—could never use telephones for their long-distance demands. The telephone developed and flourished as a local service. Thousands of new consumers entered the new market for local communication services before telegraphy's growth and robustness were affected at all. Then, as the technology improved, telephony invaded long-distance services as well.

The personal computer is another example of the power of a Type I disruption. When Apple entered the computer market in the late 1970s and early 1980s, its simple computer product, the Apple II, was far too basic to meet the needs of corporate users who required complex minicomputers to run financial and engineering applications. The Apple II could initially be sold only as a children's toy. As the personal computer improved, the disruption pulled new users into the computer market by the millions. The PC allowed people to compute conveniently for themselves rather than rely on computer specialists. Disruption led to the demise of the previously high-flying minicomputer manufacturers, such as Digital Equipment Corporation, who were unable to change their internal processes to compete with PC manufacturers.

In a third example, Intuit, the creator of the personal ac-

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counting software Quicken, seized a Type I opportunity when it realized that small businesses were using Quicken to manage their businesses because existing business accounting software was too complicated. These users were confused by unnecessary options for things like overhead costs and depreciation accounting, and, as a result, were non-consumers of business accounting products. Intuit catered to these non-consumers by creating QuickBooks, a simple business accounting software that allowed owners to keep track of their cash simply and conveniently. While QuickBooks did not have all of the functionality of other accounting products, it allowed users to get done what they were already trying to do.

On the other hand, a Type II disruption involves establishing a beachhead in the over-served low end of the incumbent's market. Here, a company takes existing technologies and turns them into a lower-cost business model that allows them to offer a new value proposition to customers who do not need all of the "extras" provided by the leading firms. As shown in Figure 2, these innovations provide customers within the existing marketplace with less performance but greater convenience and lower prices. Discount retailing, steel mini-mills, and some types of discount airlines are examples of Type II disruptions. Discount retailers, such as Wal-Mart disrupted traditional retail operators such as downtown department stores.¹¹ While department stores offered high-priced goods artfully arranged in a store staffed by well-groomed salespeople, discount retailers offered lower-priced goods that "sold themselves" with no salespeople. Customers did not need high-end salespeople to

tell them about standard goods with established brand images. They were willing to exchange the quality of the salesperson and ambience of the store for goods at lower prices. The initial customers were wives of blue-collar workers—a group that high-end retailers had little interest in serving.

Discount retailers made money in a very different way than traditional department and variety stores. The profit equation in retailing depends on two vital inputs: gross margin of inventory and the number of times inventory “turns” in a year. Department and variety stores had gross margins on their items of about 40 percent and turned their inventory over about three times in a year, giving them a return on inventory investment of about 120 percent (40 times three). On the other hand, discount retailers’ products were cheaper, with gross margins closer to 20 percent, but their inventory turned over about six times a year. Their return on inventory investment was about 120 percent. The discount retailers were as profitable, if not more so, than the department store retailers. This low-cost, high-turn business model just did not make sense for downtown department stores, which lost increasing amounts of their business to discount retailers such as Wal-Mart.

Disruptions in Higher Education

We believe disruption is quietly changing the landscape of the education marketplace across the entire spectrum of undergraduate and graduate programs. Similar to the industries

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discussed above, innovators are unlocking the gates to accessibility and affordability in education through disruptive innovations. Traditional business management programs churn out thousands of Masters of Business Administration (MBA) graduates each year, but corporate universities can now teach workers the skills they need to solve the problems they face. Community colleges teach curricula that allow students to become certified providers in many professions such as nursing and information technology, providing an opportunity to bypass a more expensive four-year institution. Online learning is creating an opportunity for thousands of adult learners to obtain a wide range of degrees in their spare time. In this section, we will delve deeply into the theory of disruption while exploring the implications these observations have for the postsecondary education sector.

Business Management Education

As mentioned at the beginning of this chapter, corporate training programs have experienced a meteoric rise in recent years. There are at least 2,000 corporate universities in the United States. In 2001, General Motors' (GM) corporate university provided almost 200,000 student days of education through approximately 1,500 courses to the company's 86,000 managerial, executive, professional, and technical employees.¹² The amount of education provided by GM alone in one year is roughly equivalent to teaching all first- and second-year MBA students at the Wharton School of the University of Pennsylv-

nia during the same time frame. Given corporations' increasing commitment to linking training and education to corporate strategy, the ever increasing ease and quality of educational content delivered via the Internet, as well as a captive audience of millions of managers, we believe corporate training poses a potential disruptive threat to traditional MBA programs.

How can an industry observer identify a Type I disruption in education? All Type I disruptions compete against non-consumption by meeting three critical requirements:

1. It targets customers who in the past hadn't been able to "do it themselves" for lack of money or skills.

These are the classic non-consumers—customers who are interested in achieving some sort of outcome but can't because of a lack of money or skills. Corporate training enables employees to take graduate-level management courses, a task many could not previously accomplish because they lacked either the skills (grades, GMAT scores) or the resources (time and money).

2. It targets customers who will welcome a simple product.

Demanding customers already consuming a product will likely reject a related disruptive innovation due to its performance limitations. But customers who are comparing the disruptive product to not consuming at all will be delighted with even the simplest of products. While most corporate training programs do not come equipped with manicured campuses, world-renowned professors, or access to a high-powered business

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network, managers of corporate training programs welcome the opportunity to deliver a simpler product designed specifically for the needs of each employee. The employees welcome the opportunity to learn the skills they desire.

Competing against non-consumption requires clearing a low hurdle. When companies try to compete against consumption, they must produce a better product to interest consumers already consuming a competing and adequate product. Unfortunately, when faced with a disruptive innovation, companies almost always invest to morph the innovation into a product that better suits the needs of their current customers rather than target a new set of non-consumers. We call this phenomenon “cramming.”

To understand cramming, think about voice recognition software. The first iterations of voice recognition software performed poorly compared to a proficient typist. Using this software required a change in behavior and the ability to master a complex new technology. Yet IBM marketed its software to typists because it was a large, obvious market. So where did voice recognition software really take hold? It successfully took root in places like the children’s animated toy market. Kids squealed with delight when they said “stop” and their robot stopped or they said “go” and their robot went. For disruptive innovations to flourish, they must be packaged in a way that delights customers whose alternative is nothing at all. Corporate university programs are flourishing because they do not try to compete with top-tier business schools. Rather, they open up the world of management education to thousands of employees who

would never consider studying for an MBA degree but need access to many of the lessons found in such programs.

3. It helps customers do more easily and effectively what they are already trying to do.

A company is not likely to succeed if its success is predicated on customers wanting to do something that they have not prioritized historically. Corporate training enables employees to solve pressing problems they face in their current jobs or learn critical skills for their next position—two outcomes every employee and employer care about deeply.

Disruption is inextricably linked to helping consumers accomplish the jobs they need to get done in their everyday lives. For example, when textbook publishers interviewed college students and asked them if they wanted the ability to probe more deeply into topics of interest that textbooks just touch on, students said “sure.” As a result, publishers spent large sums of money and time putting richer information on CDs and Web sites. The CDs often were left in their jackets and the Web sites were rarely visited. Had the publishers observed students, they would have found that what students really do is wait until the last minute to read their textbooks. What they really need is a way to help them learn quickly right before an exam and the ability to share class notes online. Applying this same logic to corporate training, a strategy positioned at educating employees simply for education’s sake, would likely fail. Like it or not, most employees are interested primarily in solving problems and qualifying themselves for promotion. Innova-

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tions in corporate training that help people achieve these desired outcomes will not only succeed, they will ultimately lead to people consuming significantly more education.

Corporate training equips and empowers a larger number of employees with the skills and knowledge necessary to contribute to their company's bottom line. In the past, the primary option for achieving this goal was for companies to send their highest performing employees to expensive MBA programs for two years. These programs might cost upwards of \$220,000, including opportunity costs. More recently, companies have sent managers to shorter, but often expensive, Executive MBA programs. These programs excel at training managers in general business theory and exposing them to a diverse network of business leaders, but they are unable to provide learning customized for each company. Moreover, the cost of these programs limits companies to sending only a handful of employees to them.

Increasing evidence indicates that companies are encouraging more of their talented young managers to learn on the job rather than to go to high-end advanced degree programs for MBAs and advanced technical degrees. Managers derive more value from these programs, which relate directly to challenges they face in their jobs, than from generic two-year MBA programs. In response, many companies now have their own universities and institutes that offer a wide range of certificates, degrees, and diplomas. General Electric reportedly spent more than \$1 billion on its 52-acre Crotonville campus nestled in New York's Hudson Valley. IBM spent more than \$500 million

on training modules delivered to managers in a “just-in-time” fashion so that they could learn exactly what they wanted, when they wanted. Nypro Inc., a precision-injection molding company in Massachusetts with 9,000 employees, sponsors The Nypro Institute, a Massachusetts accredited school that offers High School Equivalency, English as a Second Language, A.A., B.S., M.S. and M.B.A. programs.¹³

If history is any guide, these customized programs will continue to improve until they truly threaten even the most famous educational institutions. If more companies follow the example of Nypro, we believe this disruptive wave offers a new channel of access that will lead to historically underserved populations consuming much more basic and higher education—a highly desired outcome.

Disruption through Community College Programs

Community colleges are a low cost model for education. Throughout the country, these schools offer educational opportunities to students whose needs are “overshot” by or who cannot afford to attend traditional four-year institutions. Community colleges do not offer the socialization experience, world-renowned professors, or range of degrees found at four-year institutions, but the students “hiring” a community college do not need these extras to achieve the outcome they seek. Community college students attend a community college to “try out” college, develop proficiency in a specific subject area, or improve their academic resume to pursue more sub-

stantial careers. They attend community colleges because their needs are lower, or they desire a less expensive, more convenient alternative. Within community colleges, we see the elements of a Type II disruption for some degree programs offered at traditional four-year universities. How can we tell? Using the Associate Degree for Nursing program at community colleges as our test case, we can examine the two characteristics common when competing on the low end with a Type II disruption.

1. Prevailing products are more than good enough or have “overshot” customers’ needs.

Overshooting occurs when customers are increasingly less willing to pay for “extras” added on by incumbent firms. In the parlance of economists, consumers receive diminishing marginal return from incremental product improvements. Recall that discount retailers started with products that “sold themselves” and eliminated the need for expensive salespeople. The Associate Degree for Nursing (ADN) program was established in response to a critical nursing shortage in the 1950s, largely as a result of the work of Mildred Montag, who found that the four-year Bachelors of Science in Nursing (BSN) had vastly overshot the needs of many of its students.¹⁴ The BSN provided “extras” such as nursing theory and liberal arts in addition to the basic skills training requisite for passing a state licensing exam. Over the past 40 years, the ADN program has emerged as a low-cost, accessible, and recognized education alternative for becoming an RN. While the BSN degree con-

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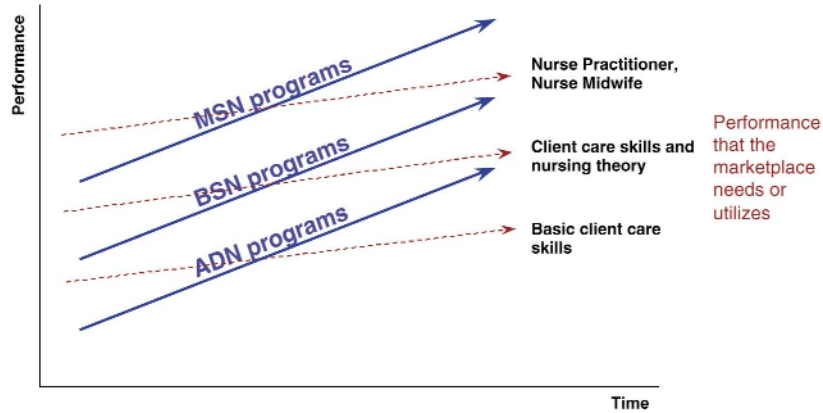


Figure 3. Disruption in nursing education programs.

tinues to be necessary for nurses who wish to work in specialized fields or pursue advanced degrees, it is not mandatory for becoming an RN.

Based on the disruption diagram presented at the beginning of the chapter, Figure 3 illustrates overshooting in nursing education.

While there is a significant difference in cost and time commitment, there is no conclusive evidence to suggest that a four-year BSN degree better prepares one to be a nurse than the less expensive two-year ADN. According to a professor at a prominent northeastern four-year program, “BSN nurses have more academic knowledge than others and are more aware of the theory, the history of nursing. But clinically [the two types] are probably equal.”¹⁵

2. Companies are able to develop a different business model that allows them to be profitable serving low-end customers.

Innovators must develop a business model that turns their relative weaknesses (compared to the incumbent) into strengths. Community colleges provide an education at a lower cost per student than four-year institutions because their faculty salaries and overheads are lower. They do not hire top-flight professors or support expensive research budgets. Because ADN programs were offered through community colleges, they entered the nursing education market with a lower cost, streamlined product and became the primary vehicle for educating RNs. The number of ADN programs skyrocketed from 7 in 1958 to more than 850 by the mid-1990s, and today more than 60 percent of all RNs are graduates of ADN programs.¹⁷

This example of a Type II disruption of a four-year program by a community college program provides valuable insight for exploring how other graduate degree programs might be disrupted in the future. By focusing on professions where the need for better access to educational programs is intense, such as nursing, information technology, or teaching, an ADN-style offering increases social and economic welfare for consumers.

Understanding Distance Learning

We can now use our understanding of disruptive innovation to explore the emergence of distance learning over the Internet and to understand how and where distance learning might be successfully deployed as a disruptive innovation.

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A *New York Times* study of online learning found that many schools' efforts to develop online learning programs failed simply because they tried "to provide traditional courses in a non-traditional manner."¹⁵ Many colleges attempted to develop programs using the Internet to create online courses involving two-way communication between top-flight professors and their high-paying students in a remote location. They were marketed as a comparable alternative to a "bricks and mortar" education. As many institutions and students came to realize, however, the quality of the program did not compare to the classroom-based degree, nor did it justify the hefty tuition costs schools were forced to charge to recover their investment and to pay their professors' high salaries. Attempting to market an inferior product to their most demanding customers was, predictably, a recipe for failure because the universities were clearly "cramming" distance learning to fit their old business models. Moreover, universities and professors who went on to develop different types of online courses, thinking the failure was in the course design, failed again when they marketed their new courses to the same demanding customers. The problem was that they were still competing against consumption.

Meanwhile, institutions such as the University of Phoenix used distance learning in a very different way by targeting non-consumers. Founded in 1976, the University of Phoenix was among the first accredited universities to provide college degree programs via the Internet. Instead of trying to use top-flight faculty and offer two-way communication, the University

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of Phoenix offered an affordable, “asynchronous format” that worked like e-mail and, therefore, could reach customers who either could not afford or did not have the time to pursue a degree at a traditional university. These relatively undemanding customers welcomed a relatively simple product. Often times, they were trying to learn specific skills to help them either in their current job or to land a new job. The University of Phoenix’s comprehensive, Web-based program competes against non-consumption by delivering convenient and flexible courses to more than 45,200 students, many of whom otherwise would not have access to educational opportunities.¹⁸ In fact, overall enrollment in distance learning programs is growing at 33 percent annually and is expected to reach five million students by 2005.¹⁹

Another example of where distance learning could take root through disruption is its use in international markets for post-secondary education. Universitas 21 (U21), a consortium of international universities, has developed a partnership with Thomson Learning to develop U21global, an online MBA program it plans to launch in Asia in 2003. Research indicates that there is a high demand for MBA programs in China and other parts of Asia, but because of the high costs and general difficulty associated with moving to another country for two years, many would-be Asian business school students have been unable to pursue advanced degrees.²⁰ These are classic non-consumers. With an expected cost of \$5,000 and availability to anyone with access to the Internet, U21’s online MBA program has a much greater chance of success as it com-

petes head-to-head against non-consumption to provide thousands of people the means of receiving an advanced degree.

As these examples show, opportunities exist to deploy online learning in both sustaining and disruptive ways. The key for those developing or managing online programs is to recognize that online learning itself is not inherently sustaining or disruptive in nature; rather, it is how and to whom this innovation is deployed that ultimately determines whether online learning will be sustaining or disruptive. Companies that adopt a disruptive approach to serving existing customers should expect to spend a lot of money to fail. To successfully introduce distance learning in a disruptive manner, companies need to either target non-consumers or develop a low-cost way to target over-served customers.

Why Disruption Matters

Disruption is a tool for change often overlooked by policymakers and industry bodies. Consider the seemingly intractable problem of the uninsured poor and their lack of access to quality healthcare. The response thus far has been to finance ever-increasing amounts of healthcare from the pockets of the wealthy. Would not a better solution be to make healthcare more affordable so that the poor can actually pay for it themselves without the help of insurance? Unlocking a wave of innovation through disruption could be a powerful way to achieve this outcome.

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Disruption is how industries achieve the seemingly incompatible goals of increased access, higher quality, and lower prices. If we are worried about the declining state of education and decreasing state and federal budgets, disruptive innovation could be a powerful new framework for the debate over how best to improve primary and secondary schools. If the debate is framed around preserving the status quo, then disruptive innovations are of little use. However, if the debate is framed around how to provide the best quality instruction at the lowest possible price to the greatest number of people, officials should find a way to encourage the creation of disruptive business models. Successful disruptive business models will fling open the doors of quality education to previously underserved and non-consuming populations. Moreover, social and economic welfare will increase as more people learn at all educational levels. It is time for us to learn from history and let disruption teach.

ENDNOTES

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