

IMPROVING HIGHER EDUCATION

In both higher education and the world of business, constant striving for improvement and excellence in one's products and services—be they computers, cameras, curricula, teaching, or research—is widely accepted as an appropriate and fruitful strategy. Yet a relentless pursuit of ever-greater quality can lead to products that far exceed the performance needs of consumers and open up a gulf between the two. Clayton Christensen, professor of business administration at Harvard Business School, explains how this

gulf is often filled by disruptive technologies, which trigger important changes in the basis of competition in their field. After describing his theory as developed in the corporate realm, Christensen applies its principles and lessons to higher education.



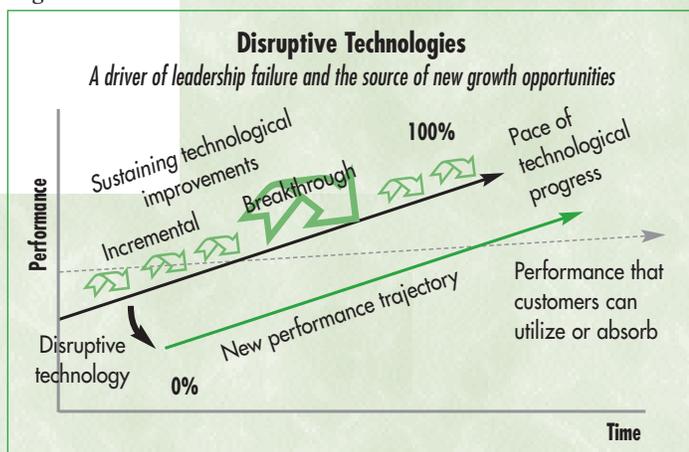
"Lobster on Black Background," Marsden Hartley.
Smithsonian American Art Museum, Washington, DC

INNOVATION THROUGH DISRUPTION

SUSTAINING VERSUS DISRUPTIVE TECHNOLOGIES

Most new technologies or improvements in services enhance the performance of established products along the lines that mainstream customers have historically valued. These sorts of innovations—whether incremental or breakthrough—are *sustaining technologies* that move a product up the technological progress trajectories shown in Figure 1 below. Research has shown that the pace of technological progress in almost every market outstrips the ability of customers to use that progress.

Figure 1.



Disruptive technologies, on the other hand, bring to market a very different value proposition than had been available previously. These innovations result in *worse* product performance, at least in the near term. They have other features that customers value, however, such as being cheaper, simpler, smaller, and more convenient to use. The fact that performance is worse is not critical, given that technologies frequently overshoot their market by progressing beyond what the market demands—that is, what customers can absorb or are willing to pay for. More important, whereas disruptive technologies may underperform what mainstream customers need upon their intro-

duction, sustaining innovations will move them up their performance trajectory so that they become fully performance-competitive at some point.

Examples of disruptive technologies include early personal desktop computers (compared with more powerful mainframes) and the small off-road motorcycles first introduced in North America by Japanese firms (compared with Harley-Davidson and BMW bikes).

By and large, it is the least-demanding and least-profitable customers in a market who initially embrace a disruptive technology. Thus, most leading companies with successful, disciplined practices of listening to their best customers and identifying new products that promise greater profitability and growth are rarely able to justify investing in disruptive technologies until it is too late. Research indicates that industry leaders generally are successful in co-opting sustaining innovations in their field and thereby maintaining their dominant positions. Nonetheless, the new markets and opportunities opened by disruptive technologies require capabilities very different than those characteristic of firms whose prevailing—and usually quite successful—strategy is to pursue high-end customers and large markets and profit margins. The list of leading companies that failed in the face of disruptive changes in technology and market

structure is long and includes well-known firms such as Digital, IBM, Apple, Sears, and Xerox.

LITMUS TESTS FOR DISRUPTIVE TECHNOLOGIES

Three key litmus tests determine whether an innovation is disruptive and likewise serve to guide decision makers as they plan responses to changes in their markets.

1. Does the innovation target customers who in the past haven't been able to do something themselves for lack of money or skills?

Many of the most successful disruptive growth businesses have given people direct access to products or services that had been too expensive or complex for the mainstream. Today, ordinary people with personal computers can handle problems that are far more complex than those that mainframes used to solve. Because the PC enabled us to compute conveniently by ourselves, we now consume infinitely more computing—disruption pulled new users into the market by the millions. Similarly, disruptive online stock brokers such as Charles Schwab and E*Trade enable middle-income investors to manage their own investments daily, from the convenience of their homes. These innovations have led to enormous growth in stock trading.

2. Is the innovation aimed at customers who will be delighted to have a simple product?

A disruptive product is technologically straightforward and targeted at a set of customers who will be pleased with a simple product. If an innovation passes the first test by enabling new users to consume for themselves, then it is likely that it will pass this test, provided its innovators can resist the temptation to improve the technology to the level of the high-end customers' performance trajectory before releasing it (at which point it is unlikely to be either simple or inexpensive).

3. Will the innovation help customers do more easily and effectively what they are already trying to do?

At a fundamental level, the things people want to accomplish in their lives don't change quickly. That explains why the performance demand trajectories in Figure 1 are as flat as they are. The disruption of the photographic film industry by digital imaging illustrates this point: more than 90 percent of photographs are looked at once before being stashed away in a drawer or box; thus complicated software programs that allow people to edit out red-eyes from flash shots or arrange online photo albums are fighting an uphill battle in making it easier for customers to do what they weren't

already trying to get done. On the other hand, people do like to share photos, and so programs that allow us to send images simply and conveniently online meet this litmus test.

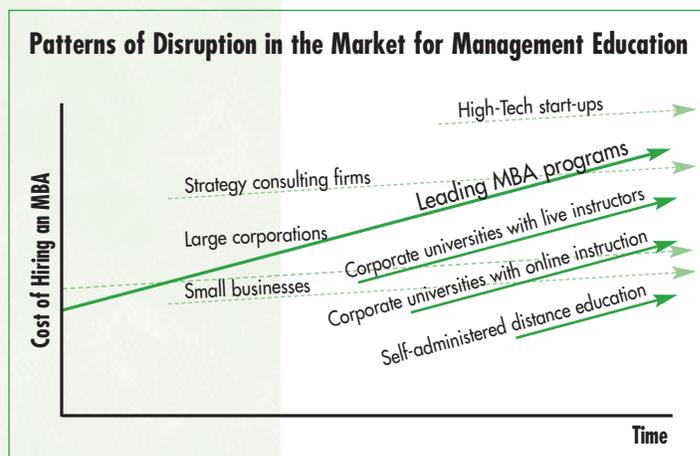
IMPLICATIONS FOR HIGHER EDUCATION

Although my focus is on management education—and specifically on leading business schools because they are what I know best—the disruption framework is more broadly applicable across institutions and disciplines.

Like other markets, the market for management education can be described in terms of trajectories of improvement that customers can use and by trajectories that the innovators provide. For these purposes, the salaries garnered by graduating MBAs will be plotted on the vertical, performance axis of the model.

In 2000, the average starting salary for graduating MBAs from leading business schools exceeded \$130,000. Although this is good news for the students, what does it mean for the business schools themselves? As Figure 2 illustrates, the cost of the business schools' "products" has overshot the salary structures that mainstream operating companies can absorb, as shown by the dotted lines on the figure. As faculty and administrators expend an extraordinary amount of energy, talent, and money improving the MBA program, it clearly is serving a very

Figure 2.



“Because the PC enabled us to compute conveniently by ourselves, we now consume infinitely more computing—disruption pulled new users into the market by the millions.”

small high-end segment of the market for managers. The response of many leading corporations has been to look elsewhere for managerial talent. Intel and Dell Computer, for example, have announced that they will no longer recruit at the Stanford Business School for these reasons.

Corporate universities and in-house training programs are disrupting the leading business schools: In the United States, the number of employees actively participating in in-house management development programs is increasing by 30 percent every year. The number of formally organized corporate universities increased from 400 in 1990 to 1,800 in 1999. Eight times as many people are now receiving management training in a corporate context than are enrolled in MBA programs. A significant portion of in-house management training consists of just-in-time, custom-assembled short courses that management development staffs put together to help specific groups and teams work through specific problems.

At this point, corporate universities have opened new markets in the lower and mainstream tiers by offering simpler and more convenient programs. History has shown, however, that such disruptive innovations typically expand the market dramatically and then migrate inexorably up-market. Ultimately, they pin the original leaders in the highest tiers of the market where there simply is not enough volume to sustain them all, as once-dynamic firms such as Silicon Graphics and J.P. Morgan have recently discovered.

CONCLUSION

The nation's leading business schools are being disrupted and must fundamentally rethink their business models if they hope to thrive in the future. Although occupying the highest tier is a worthy goal for colleges and universities, campus leaders must also vigilantly guard against their

becoming more and more out of touch with the mainstream and therefore increasingly irrelevant. Each institution's goals and mission will necessarily evoke a different response to this dilemma. What is critical, though, is that the dilemma be recognized and actively addressed by our nation's leading colleges and universities.

Clayton Christensen is professor of business administration at the Harvard Business School. His book, *The Innovator's Dilemma* (1997), received the Global Business Book Award for the best business book published in 1997. In 1995 Christensen won the McKinsey Award for the best article published in the Harvard Business Review.