IDEA GROUP PUBLISHING
701 E. Chocolate Avenue, Suite 200, Hershey PA 17033-1240, USA
Tel: 717/533-8845; Fax 717/533-8661; URL-http://www.idea-group.com
ITB12866

This paper appears in the book, *Emerging Trends and Challenges in Information Technology Management, Volume 1 and Volume 2* edited by Mehdi Khosrow-Pour © 2006, Idea Group Inc.

Online Education as a Technology Innovation in Higher Education

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INTRODUCTION

Online education is a technology innovation in higher education that is rapidly changing a sector very much steeped in tradition. Between the Fall 2003 and Fall 2004 semesters, online course enrollments in public and private colleges and universities in the United States increased from 1.9 million online students to 2.6 million, an increase of 37% (Allen & Seaman, 2004). This growth is projected to continue at a rate of 20% per year through 2007 (Gallagher, 2004). This compares to total online course enrollments of approximately 800,000 students in 1994 (Lewis, Snow, Farris & Levine, 1999).

Online education offers institutions of higher education:

- New markets through expanded geographic boundaries;
- New educational models (e.g., blended learning, accelerated programs) that appeal to a broader range of learners (e.g., adult learners, executives, single mothers);
- New technologies and techniques for enriching the curriculum and learning experience.

At the same time, online education raises significant challenges and competitive threats to traditional institutions of higher education:

- Expanded geographic boundaries increase the bargaining power of students who can now shop among geographically dispersed institutions.
- New technologies and techniques challenge the traditional lecture method, suggesting that other methods and technologies may be more effective in educating the 21st century student.
- Relatively new for-profit entrants to the field such as the University of Phoenix and Capella University are investing in proven CRM systems and methods, increasing their yield on student recruits and pressuring traditional institutions to review and change their recruitment methods.

The combined challenges of growing competition and changing educational and business models are forcing many traditional public and private institutions of higher education to adopt online education as a strategy for remaining competitive and solvent in the coming decade. These opportunities and challenges require higher education to rethink markets, programs, and operations, not unlike the global competition facing many other industries in this emerging knowledge economy. By sharing his experience in the development, launch and management of an online education program at a major public university, the author will illustrate how emerging principles of innovation theory apply to the successful adoption of online education in higher education.

INNOVATION THEORY AND ONLINE EDUCATION

The opportunities and challenges faced by higher education as online education grows in popularity are consistent with Rogers' definition of a technology innovation. Rogers suggests a technology innovation creates uncertainty regarding consequences among potential adopters while offering opportunity, and the potential for reducing uncertainty, in other areas (1995). So while online education raises competitive threats to traditional institutions, it also offers all institutions the technology and methods for combating these threats. The challenge becomes whether or not an institution chooses to adopt the innovation and then how it chooses to implement the innovation.

During the rise of the dot com economy of the late 1990's numerous market studies suggested that the education sector, driven by online and professional education opportunities, was the new "killer app" for both traditional institutions of higher education and for new business entities. Between 1990 and 2000, PriceWaterhouseCoopers estimates $6 billion in private capital was invested in education companies, either for-profit spin-offs of traditional colleges and universities or new ventures launched by for-profit partners (PWC, 2000).

The for-profit spin-off model pursued by institutions and companies such as New York University, Columbia University and Harcourt-Brace Publishers, required significant upfront capital and human resource investments to build custom programs with brand names. Those who sought this model believed that they had to circumvent traditional academic structures to create a more cost-effective, profitable model for delivering higher education through e-learning (the catchy marketing term used to describe online education). While many for-profit and spin-off ventures failed by 2001 (Blumenstyk, 2001; Carlson & Carneval, 2001; Carr, 2001), those that survived captured a disproportionate share of the online higher education market. By 2004, for-profit institutions accounted for 33% of online enrollments while they represented only 6% of total higher education enrollments (Gallagher, 2004). In regard to online education revenue, for-profits garnered 44% of revenues in 2004, typically charging higher tuition rates for adult professional programs (Gallagher). Successful for-profit institutions, those that survived the dot.com bust, clearly adopted online education as their preferred education delivery method and focused on the non-traditional adult market.

A successful alternative to the for-profit spin-off model evolved among a number of traditional, non-profit colleges and universities. This model involved keeping online education within the umbrella of the traditional institution but providing it with freedom and space to develop specific target markets. Penn State developed their online World Campus program, the University of Maryland University College launched online business and technology programs, and the University of Massachusetts located their online education in their Continuing Education units, uniquely situated to meet the needs of non-traditional adult learners. While these programs each took slightly different forms, they each developed very successful online programs which leveraged the existing university brand and academic resources.

The disruption in the higher education learning space as result of the 1990's e-learning boom and bust is reminiscent of Christensen's discussion of sustaining and disruptive technologies (1997). In his discussion of how established companies and entire industries respond to technology innovation, Christensen makes a distinction between sustaining technologies, those which improve product performance or service consistent with customer or market values and demands; and disruptive technologies, innovations that may not meet customer performance demands when first released but which, overtime, help establish a new standard, method and possibly industry. While the initial for-profit play in the online education space may have threatened traditional higher education's monopoly on a college education, higher education's response and adoption of this technology innovation suggests the tech-

nology offers a sustaining potential for existing colleges and universities. The case example discussed below illustrates how online education was introduced as a sustaining technology by one traditional provider of higher education, the University of Massachusetts Lowell.

ONLINE EDUCATION AS SUSTAINING TECHNOLOGY

The University of Massachusetts Lowell (UML) launched its first six online courses in the Fall of 1996, approximately 2-3 years before the large venture investments in e-learning discussed above were funded. Over the course of the next eight years, UML's online program grew from 115 online enrollments in 1996 to over 7000 online enrollments in 2004. Over this period, gross tuition revenues from online courses grew from $171,000 to $5.9 million. In academic year 2004, the $5.9 million generated by the University's online enrollments accounted for 45% of the tuition revenues collected by the University's Division of Continuing Studies and Corporate Education (CSCE, 2004). In addition to proving financially solvent, the University's online program has been nationally recognized for both its scope and quality, receiving three prestigious awards from the Sloan Consortium on Online Education (http://www.sloan-c.org/news/pr/pr051003a.asp, Jan. 06, 2006).

The online program at UML originated within the University's Division of Continuing Studies and Corporate Education (CSCE), outside the University's mainstream academic programs in an environment with a distinctly more entrepreneurial approach to education. Continuing Studies and Corporate Education is an autonomous business unit within the University, funded solely through the revenue generated by course enrollments. The location of the online program within CSCE, rather than in the traditional academic departments likely assisted its development and growth. As both Christensen (1997) and Rogers (1995) suggest, attempting to develop and commercialize a technology innovation within the mainstream organization is often counterproductive, since it must then compete with established projects and their management for limited resources and funding. By locating the innovation in an autonomous business unit, a spin-off company or even a skunkworks (Rogers, p.139), an organizational unit may emerge dedicated to the success of the innovation.

The initial selection of six online courses represented the volunteer efforts of faculty innovators, individuals on campus who believed the Internet and World Wide Web offered some unique potential for reaching out to new students. Their online courses were offered outside of the traditional on-campus day programs, taught as an overload and were typically offered to a non-traditional adult student audience. These initial faculty innovators required minimal training and support, many came to online education with a growing knowledge of HTML and Internet savy. They understood the online program was venturing into new academic and technological territory and were eager to be a part of it.

At this point it's important to address the concept of Adopter Categorization as introduced by Rogers (1995) and popularized by Moore (1999). Adopter Categorization identifies five categories along a normal bell curve at which an individual adopts an innovation. Starting from left to right, the categories include Innovators, Early Adopters, Early Majority, Late Majority, and Laggards. Innovators and then Early Adopters are among the first to adopt an innovation, followed at some point by the Early Majority, Late Majority and last, but not least, the Laggards. In regard to online education, it's important to keep in mind that two groups of people, teachers and students, had to adopt the innovation in order for it to be successfully integrated into the business. Additionally, their adoption of the innovation should hopefully coincide in order to adequately meet student demand and avoid over-investing in faculty, support resources and course materials.

As the online program grew and students demanded additional online classes and degree programs, CSCE had to reach out to a new wave of online faculty, the Early Adopters and the Early Majority. These faculty often came to the program with fewer technical skills and perhaps some reservations regarding the feasibility of teaching students from a computer over the phone line. Their participation, required in order to offer degree programs completely online, was supported through the development of a faculty training and support program. One challenge in developing appropriate support resources for early adopters and the early majority, was balancing the cost of support against the revenue generated by the online program. A balance sheet was developed, mapping potential revenues to projected development and operating costs. This spreadsheet helped to evaluate and prioritize development efforts and investments. As the program matured, it provided a tool for weeding out weak performers, preserving resources for strong performers.

While the Division's initial foray into online education was open to all, later efforts focused on specific certificate and degree programs where target audiences were more likely to adopt the innovation. For example, the first online certificate program launched was a six course UNIX certificate program, the rationale being that UNIX instructors and students interested in learning UNIX were more comfortable working with Internet technology (i.e., Innovators and Early Adopters). Due to their collective comfort level, initial development and support costs were low, providing the Division with an early success and proof of concept from which to build. This approach is consistent with Christensen's recommendation that initial investments in disruptive technologies be "fast, inexpensive, and flexible" (1997, p.227), providing an opportunity to test the technology, the market and the organization at limited cost. This approach worked well for CSCE, which now offers ten complete degree programs and fourteen certificate programs completely online.

SUMMARY

In reviewing this case, one finds confirmation of several of Christensen's and Roger's key points. These include the need to:

- launch the innovation from outside the mainstream organization,
- develop a "fast, inexpensive, and flexible" approach,
- match the product or service to market needs (in this case, serving the educational needs of non-traditional adult students),
- watch the bottom line.

What is not is clear is whether Christensen's distinction between sustaining and disruptive technologies applies to online education. In their follow up to The Innovator's Dilemma, Christensen and Raynor suggest "the Internet was a sustaining innovation relative to the business models of a host of companies " (2003). By this the authors suggest that the business model, the way many companies make money with the Internet, has not changed. Colleges and universities make money by selling courses, education and academic credentials. While the delivery method of education has changed, the product has not (though some would certainly argue this point). On the other hand, the emergence of significant competition in the form of for-profit virtual universities continues to challenge traditional institutions of higher education, requiring these institutions to explore new markets and adopt new strategies, including but not limited to online education. What is clear is that online education, as a technology innovation, has made a significant impact on how a college education is provided in the 21st century.

REFERENCES

Allen, E., & Seaman, J. (2004). *Entering the Mainstream: The Quality and Extent of Online Education in the United States, 2003 and 2004*: 27. Needham, MA: Sloan Center for Online Education.

Blumenstyk, G. (July 10, 2001). Temple U Shuts down for-profit, *Chronicle of Higher Education.*

Carlson, S. and Carnevale, D. (December 2001). Debating the demise of NYUonline, did the venture go under because of the changing economy or bad decisions? *Chronicle of Higher Education.*

Carr, S. (February 10, 2001). Is anyone making money on distance education, colleges struggle to figure out how much they are spending on online programs, *Chronicle of Higher Education.*

Christensen, C. M. (1997). *The Innovator's Dilemma: When new technologies cause great firms to fail.* Boston, MA: Harvard Business School Press.

Christensen, C. M., & Raynor, M. E. (2003). *The Innovator's Solution: Creating and sustaining successful growth*. Boston, MA: Harvard Business School Press.

CSCE (2004). *Continuing Studies Annual Report 2003/2004*. Lowell, MA: University of Massachusetts Lowell.

Gallagher, S. 2004. Online Distance Education Market Update: A Nascent Market Begins to Mature. In S. Gallagher (Ed.): 13. Boston, MA: Eduventures.

Lewis, L., K. Snow, Farris, L. & Levin D. (1999). *Distance Education at Postsecondary Education Institutions: 1997-98*. Washington, DC: National Center for Education Statistics, U. S. Department of Education.

Moore, G. A. (1999). *Crossing the Chasm: Marketing and Selling High-Tech Products to Mainstream Customers***.** New York, NY: Harper Business.

Rogers, E. (1995). *Diffusion of Innovations, 4th ed.*, New York: The Free Press.