Articles

Adopting Disruptive Technologies in Traditional Universities: Continuing Education as an Incubator for Innovation

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Abstract

A recent book by Clayton M. Christensen, Associate Professor of Business at Harvard University, discusses the sometimes devastating impact in the corporate environment of what he refers to as "disruptive technologies." Successful, well-managed firms that dominate their markets have sometimes gone into a sharp decline or even collapsed when a new technology disrupts the pattern of their market segment. Other firms, however, have handled such transitions smoothly, maintaining their position of dominance in the market by employing specific techniques to integrate the new and disruptive

Résumé

Un livre récent de Clayton M. Christensen, Professeur adjoint en Administration des affaires à l'Université Harvard, examine l'impact parfois dévastateur dans le milieu des affaires de ce qu'il appelle les "technologies perturbatrices."

Les universités traditionnelles axées sur la recherche dominent le "marché" de l'éducation supérieure, mais commencent à ressentir l'impact des technologies perturbatrices comme l'éducation à distance. Elles pourraient s'inspirer de l'étude de Christensen sur l'impact des technologies dites perturbatrices dans le monde des

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technology into their operations.

Traditional research universities enjoy a dominant position in the higher education "market," but they are beginning to feel the impact of disruptive technologies such as distance education. They may benefit not only from an examination of the insights that Christensen has derived from his study of the impact of disruptive technologies in the corporate environment but also from a selective application of the techniques for coping with disruptive technologies that Christensen has found to be effective in the business world. Some of these techniques imply an important role for continuing education units as semi-autonomous incubators of disruptive innovations.

affaires. Elles pourraient aussi sélectionner et appliquer les techniques pour faire face aux technologies perturbatrices que Christensen considère efficaces dans le monde des affaires. Certaines de ces techniques impliquent un rôle important pour les unités d'éducation permanente comme incubateurs semi-autonomes d'innovations perturbatrices.

Introduction

As employees of university continuing education units, we have become used to the idea that we are working in a business. We have dutifully studied articles and books about good business practices and have attempted to apply them, where appropriate, in our practice of providing continuing education. We have engaged in Total Quality Management, Re-Engineering, and Just-In-Time learning. We have analyzed the trends in our markets, we have listened to our customers, we have made investments (including investments in technology) in products and services that our customers have told us they want. Overall, by following what are widely considered to be effective management practices we have improved our practice of university continuing education, at least from the viewpoint of

economic viability in the "business climate" within which our units and our universities operate.

However, a recent book suggests that we cannot always expect a happy outcome from following good business practices. Harvard professor Clayton M. Christensen, in his book, *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail* (1997), cites many cases of highly successful companies, leaders in their fields and acknowledged to be exemplars of good management practice, that have rather suddenly lost their dominant position in the market and in some cases gone bankrupt. This happened not because they suddenly adopted bad management practices, but precisely because they persisted in adhering to good management practices.

Christensen's analysis of why this happens is fascinating in itself, but even more so because it may have implications for universities in general, and their continuing education units in particular. He argues that the unexpected failure of once-dominant firms is often related to a change in the technology employed in their industry.

Although universities currently enjoy a dominant position in the post-secondary education "industry," this "industry" now seems to be entering a period of rapid technological change — the sort of period in which the leading firms in an industry may find themselves abruptly eclipsed by new players. The next few years could see a sudden change for the worse in the position of universities in an educational marketplace that is being transformed by new technologies.

Such a decline is far from inevitable, however. Christensen notes ways in which successful firms can continue to be successful while passing through a technological discontinuity. Applying his suggestions, selectively, to the university context could result in a new and critically important role for the continuing education unit within the university.

Disruptive and Sustaining Technologies

According to Christensen, the main reason why successful and apparently well-run organizations can and do fail is their failure to recognize the distinction between *sustaining* technologies and *disruptive* technologies. Sustaining technologies improve the performance of established products. Indeed, they are often developed by successful companies, the leaders in their fields, for and in close collaboration with their most important and

lucrative clients. In other words, they are often the result of those successful firms following the excellent business practice of listening closely to their customers. Technologies, in the sense that Christensen uses the word, may refer to either "hard" technologies that result in new types of physical goods (e.g., hard disk drives) or "soft" technologies that result in new ways of organizing work or providing a service (e.g., new systems of pricing, inventory, or production).

In contrast to sustaining technologies, which improve the performance of established products, disruptive technologies often result in *worse product performance in the mainstream market*, at least in the short run, for example, a gravel truck unable to haul as big a load as existing models. "But they have other features that a few fringe (and generally new) customers value. Products based on disruptive technologies are typically cheaper, simpler, smaller, and, frequently, more convenient to use." (p. xv). One example of such a technology cited by Christensen is the transistor, as compared to vacuum tubes. He suggests that in the near future "internet appliances" may become disruptive technologies, as compared to personal computers (p. xv).

In the brief summary that follows, Christensen (p. xvii) suggests why successful companies often fail to invest aggressively in disruptive technologies, which costs them in the long run.

> First, disruptive products are simpler and cheaper; they generally promise lower margins, not greater profits. Second, disruptive technologies typically are first commercialized in emerging or insignificant markets. And third, leading firms' most profitable customers generally don't want, and indeed initially can't use, products based on disruptive technologies. By and large, a disruptive technology is initially embraced by the least profitable customers in a market. Hence, most companies with a practised discipline of listening to their best customers and identifying new products that promise greater profitability and growth are rarely able to build a case for investing in disruptive technologies until it is too late.

Christensen makes a convincing case that the very rational refusal by successful companies such as Sears and DEC to invest in disruptive hard or soft technologies can lead to their rather sudden loss of dominance in their respective fields, if not their total disappearance. But, what does this have to do with university continuing education? In the following sections, it will be argued that much of Christensen's analysis of cases in which disruptive technologies have undermined the position of previously successful business firms can be applied directly to the university context.

Furthermore, his recommendations for coping with the effects of disruptive technologies can also be applied in this context.

The University Context

Public universities are not business firms. There are enough similarities, however, to allow Christensen's insights, built on his observations in the business environment, to be selectively applied to universities.

It should first be noted that the distribution of power is considerably different at universities than it is in business firms. Christensen discusses (pp. 103–104) the limited power that employees of a corporation have to either thwart or further the directions of their senior administrators. In contrast, as a result of a consensual governance structure, the ability of the lower ranks in universities to assert their will, individually and collectively, is considerably greater. With this in mind, the university faculty will be referred to in the discussion that follows as a quasi-distinct entity, as compared to "the corporate university" led by its administrators, board, and public funders.

It should also be noted that universities, as opposed to corporations, have some of the characteristics of a service-providing government bureaucracy, which is most evident in undergraduate teaching. The university environment is quite unlike the corporate environment in that there is a more or less captive clientele, there is little or no competition, and the effects of good or poor performance on the part of the person dealing with the client, that is, the professor, are neither serious nor cumulative. In short, professors' bank accounts and future career prospects are not much affected by undergraduate teaching, so long as their performance is maintained above a certain minimal level.

In research-intensive universities, this picture changes drastically when we shift the focus to the research function of the university. Intensively competitive, successes in attracting research funding and publishing the results of research are trumpeted in the *curricula vitae* of individual professors, in the publicity documents of their departments, and by the university as a whole. Success, or lack of it, does have a serious and cumulative effect on the careers of professors: research funding attracts more research funding and more graduate students to do the detail work; publications generate more publications, which in turn attract more students and more funding. Research is the lucrative part of the "market" addressed by research universities and the professors who work in, and to a

large extent run them. Part of the profit derived from this segment of the market is in money (salary increments), but much of it is in those intangibles that are so important to professors, namely, prestige among peers and career satisfaction (Lucas, 1996, pp. 169–202).

Applying Christensen's terms to the environment of public universities in Canada, it is easy to identify undergraduates as being among the university's "least profitable customers" (continuing education students have also fallen into this category, but this may be changing). The monetary return derived from these undergraduate "customers" is largely controlled by provincial government regulations, and competition is much reduced by factors of geography. For most professors, teaching undergraduates generates little in the way of the intangible rewards of prestige among peers, and it takes time away from the graduate student supervision and research activities that do generate such rewards. Therefore, there is little incentive among research-intensive universities and their professors to pay much attention to this unprofitable "market segment."

It is among a few customers with special needs in this unprofitable market segment that some mainly small and new institutions have nurtured a disruptive technology — the same type of market segment, according to Christensen, where disruptive technologies first penetrate the business environment. The special needs customers in the higher education market are those who cannot access a conventional university program, and the disruptive technology that has emerged is distance education. An increasingly well-known example of a new, small institution that has mastered this disruptive technology by serving these low-profit-margin customers is Athabasca University. An interesting parallel to the leading corporations that have cheerfully relinquished the lower end of the market to such small, upstart users of disruptive technology is the University of Alberta. Over the past two decades, it has largely withdrawn from its previously extensive program of off-campus delivery of undergraduate programs as its professors were no longer willing to invest the time and effort required to take part in such programs, even when there were requests from communities. The University of Alberta professors (and the institution, in its strategic planning documents) have preferred to focus instead on the more profitable market segments of research and graduate programs, leaving the bottom end of the market to Athabasca. That small, new institution could thrive in this apparently insignificant segment of the market, while the large, established University of Alberta could not.

In "retreating upmarket," the University of Alberta and its professors

have mirrored the practice of such leading corporations as US Steel, which abandoned the making of rebar, the lowest segment of the steel market, to small, new companies that had learned how to use a new, disruptive technology, the mini-mill. US Steel and the other leading steel companies moved upmarket, concentrating on higher grade, higher margin products for their best (most lucrative) customers. Ironically, those companies that mastered the mini-mill in low margin rebar have followed the leading companies upmarket, using their steadily improving mini-mills to produce higher quality steels for the more lucrative segments of the market, with a resulting increase in overall market share and profitability.

An interesting parallel in the educational marketplace of this process of a new player establishing itself at the bottom of the market and then moving upmarket is Athabasca University's recent and successful launching of two new distance–delivered graduate programs. The upmarket position of established institutions such as the University of Alberta is beginning to look less secure, although at present the authors are not aware of any Canadian public university having to actually close its doors, the fate of many of the corporations mentioned by Christensen that failed to cope with disruptive technologies and were subsequently eclipsed by new more savvy competitors. As Turoff (1997) and others have noted, however, we are now entering an era of worldwide competition in higher education, and the survival of the fittest dynamic that has governed business for so long may start to claim casualties among universities as well.

Distance Education as a Disruptive Technology In University Education

University education has been delivered, for many decades, mainly via that mixture of hard and soft technologies referred to as the lecture method. The "hard" aspect of this technology consists of a physical lecture hall that may be enhanced with various audio-visual equipment. The "soft" aspect of the lecture method consists of the organizational framework devised by the individual instructor within a discipline-based content and disseminated in real time. Various sustaining technologies have refined and improved lectures over time, including improved audio-visual equipment and presentation software, and in some cases better training of lecturers and more effective methods of collecting evaluative feedback from students on a systematic basis.

Distance education is in dramatic contrast to this standard "product" in that it eliminates the "same place" feature of the lecture method, and in some forms of distance education the "same time" feature as well. It may also eliminate the lecturer *per se*, with this function being divided among "subject matter experts," instructional designers, and course section tutors. Clearly, it is a discontinuity in university education. However, according to Christensen, discontinuity with previous practice is not the defining feature of disruptive innovations; some sustaining technologies have also been discontinuous. Thus, it is necessary to consider whether distance delivery of university education meets his description of a disruptive technology, that is, 1) that it results in a product that is typically smaller, cheaper, and less profitable to the producer; 2) that it is first commercialized in emerging or insignificant markets; and 3) that leading firms' most profitable customers generally do not want products based on disruptive technologies — these products are initially embraced by the least profitable customers in a market.

1. *Is distance education simpler and cheaper than the lecture method, and does it promise lower margins, not higher profits?* Yes, it is cheaper, if not necessarily simpler, for certain students to enrol in a distance program rather than moving to a city where there is a university and perhaps giving up employment in order to accommodate the rigid schedule of conventional programs. And, yes, it certainly does offer a lower monetary margin to the conventional campus-based university, as it is generally more expensive to create a special program for distance students than to add them into existing on-campus courses.[1] In terms of the non–monetary reward system, creating and teaching distance courses is unlikely to earn a professor the prestige that the same amount of time invested in research and publication would garner.
2. *Was it first commercialized in emerging or insignificant markets?* Yes, distance education, in both the correspondence format developed in the 19th century and the technology-enhanced form pioneered by the British Open University in the 20th century, has addressed small groups of learners peripheral to the central concerns of universities, whose core clientele has traditionally been the young adults who are able to attend on-campus lectures.
3. *Is it the case that universities' most profitable customers generally do not want, and indeed initially cannot use, products based on distance education?* Here Christensen's criteria are less successfully met.

> Although few of the universities' most profitable customers (i.e., graduate students) initially accessed distance-delivered programs, this may have been largely the result of university policies enforced by such gatekeepers as deans of graduate studies (Kirby & Garrison, 1990). The initial lack of distance-delivered programs at the graduate level may, therefore, have been the result of a reluctance to provide such programs, rather than these "most profitable customers" not wanting them. Whatever the cause of the initial lack of penetration of distance education into this segment of the market, the situation is changing very rapidly with the recent introduction of distance-delivered graduate programs from new providers such as Athabasca University, and the entry into the market of established leading universities such as Queen's and Western Ontario with their upscale, distance-delivered MBAs.

Considering the above three defining criteria, distance delivery of university education does seem to correspond relatively well to Christensen's description of a disruptive technology. What, then, should established conventional universities do to avoid having their position in the educational marketplace eroded by the disruptive technology of distance education? Christensen has some suggestions based on his observations in the world of business that might possibly be applied selectively in the higher education environment by universities wanting to ensure their continued survival and success.

The following section discusses four techniques which, according to Christensen, have allowed current leading business firms to cope successfully with disruptive technologies in the corporate environment. The final sections suggest how these techniques can be and are being applied in the university environment.

How a Leading Firm can Encounter a Disruptive Technology and Live to Tell the Tale

Christensen describes four techniques by which leading firms can defend their position in the face of the intrusion of a disruptive technology into their market (pp. xix–xxii, 99, and 101–211 passim). These techniques are based on what he refers to (p. 99) as four principles of organizational nature.

1. Resource dependence: Customers effectively control the patterns of resource allocation in well-run companies.
2. Small markets don't solve the growth needs of large companies.
3. The ultimate uses or applications for disruptive technologies are unknowable in advance. Failure is an intrinsic step toward success.
4. Technology supply may not equal market demand. The attributes that make disruptive technologies unattractive in established markets often are the very ones that constitute their greatest value in emerging markets.

Clearly, these principles tend to militate against the adoption of disruptive technologies by successful, established firms. Managers who have tried to introduce disruptive technologies directly in the teeth of these principles have almost always failed. For example, managers at DEC, the leader in the mini-computer market, failed repeatedly in their attempts to penetrate the personal computer market. However, Christensen (p. 99) goes on to note techniques that successful managers of established firms have used, in judo fashion, to turn these principles to their advantage while successfully adopting disruptive technologies.

1. They embedded projects to develop and commercialize disruptive technologies within an organization whose customers needed them.
2. They placed projects to develop disruptive technologies in organizations small enough to get excited about small opportunities and small wins.
3. They planned to fail early and inexpensively in the search for the market for a disruptive technology. They found that their markets generally coalesced through an iterative process of trial, learning, and trial again.
4. When commercializing disruptive technologies, they found or developed new markets that valued the attributes of the disruptive products, rather than search for a technological breakthrough so that the disruptive product could compete as a sustaining technology in mainstream markets.

How can these same techniques be used to successfully introduce disruptive technologies such as distance education into a conventional university?

Continuing Studies as Incubator

How can universities invest in disruptive technologies that may be crucial to their long-term success, if not survival; that is, how might they apply the four judo-like strategies described above in the university context? The answer to this question will vary from one institution to the next, as each is operating in a somewhat different environment and has a unique history and structure. The University of Alberta will be offered as a case study of an established conventional university, that has developed some strategies that correspond for the most part to some of those developed by Christensen in the corporate environment.

Christensen's first two strategies outlined above assert that the only viable means for a large, successful, established organization to invest in and develop disruptive technologies is to create (or acquire) a unit that can operate relatively independently of the rest of the organization. This unit must be protected from the corporate demands, success criteria, and volume demands of the mainstream organization in order for it to successfully define and develop new markets. In most universities such a unit already exists under the various designations of "continuing education," "continuing studies," "extension," or "outreach." These units generally have a cost structure that can achieve profitability with small markets and low margins and a decision-making process that supports rapid prototyping and development of courses and learning products. This is the ideal context in which to incubate disruptive technologies such as distance education. As Christensen states:

> The innovator's task is to ensure that this innovation — the disruptive technology that doesn't make sense — is taken seriously within the company without putting at risk the needs of present customers who provide profit and growth (p. xxiv).

In the university context, with its much higher level of employee (professoriate) control, this safeguarding of the interests of present customers is particularly necessary, as their interests are closely bound up with the interests of the faculty. In conventional universities it is of utmost importance to recognize the legitimate needs of full-time, on-campus learners and the traditional, core values of the institution, including the intense interest of the professoriate in the research function. If these interests are not safeguarded, the mainstream of the university faculty, administration, and even students will most certainly resist disruptive developments such as the introduction of distance delivery of instruction.

For internal political reasons, the continuing mainstream operation of the university must be maintained in a state of reasonable contentment, so that both the university as a corporate entity and its powerful professoriate will continue to tolerate and support the "skunkworks" that operates outside the mainstream and is charged with adopting disruptive technologies such as distance education. Attention to new, disruptive technologies should not preclude sufficient attention being paid to the sustaining technologies that will allow the central core of the institution to maintain its favourable position in the marketplace.

The Faculty of Extension at the University of Alberta has recently been given the mandate to provide leadership to the University in adopting learning technologies to enhance on-campus learning, as well as to improve access to off-campus learners. A unit of the faculty, Academic Technologies for Learning (ATL) (http://www.atl.ualberta.ca), was created and funded centrally by the University specifically to support, champion, and advocate application of instructional technologies to the teaching/learning function of the University. In retrospect, this move has proven to be very insightful. Although the reasons for this assignment of responsibility to the marginal Faculty of Extension were complex, the central administration understood the need to position this "disruptive unit" somewhat outside the mainstream of the University — a technique that Christensen suggests in the business context. That is, the function of adopting both sustaining and disruptive technologies was placed in a faculty committed to change, with a record of entrepreneurial initiatives and an understanding of emerging markets, audiences, and technologies.

Leadership of such units, which are on the one hand charged with development of disruptive technologies and on the other hand have to maintain credibility within the value system of the parent institution, is of critical importance. ATL and Extension are led by academics who have a responsibility for teaching and research that is similar to academics in the mainline departments. This equivalent status and job skill set are critically important for the survival of the disruptive unit within the power context of the modern research university (Rossner-Merrill, 1996). In other words, the inhabitants of the skunkworks should not smell entirely different from the inhabitants of the main part of the institution.

Following the establishment of ATL, the Faculty of Extension identified the development of an Institute for Professional Development (IPD) as a major strategic initiative. The purpose of the institute is to be a catalyst and coordinator for professional development activities as well as to provide

services in the areas of market research, program planning, knowledge management, and research in professional development. The establishment of the institute not only draws attention to an important and growing market but also provides an opportunity for buy-in and ownership of the initiative by the mainstream faculties and departments. In this way it supports faculties in partnering with professional associations and business organizations.

The IPD and ATL are semi-autonomous units designed to help the University maximize the advantages of disruptive technologies by operating somewhat outside the often cumbersome set of rules and demands that apply within the main body of the institution. Each provides consulting expertise and training opportunities, both mediated and face-to-face. In addition, ATL maintains a 35-station production studio where faculty and graduate students receive technological and pedagogical assistance in creating or converting courses using technological delivery and support. The IPD also focuses on knowledge management, in which technologies are used to develop and apply knowledge-based decisions "just in time" to practical workplace problems. Both the IPD and ATL are closely analogous to the "spin-off" units implied by Christensen's first two techniques for successfully coping with disruptive technologies in the corporate environment.

Christensen's third technique — failing early and inexpensively in the search for a market for the disruptive technology — presents a considerable challenge to the core values of the conventional university as it is based on the principle that applications of disruptive technologies are unknowable in advance and failure is an intrinsic step toward success. Prestigious universities do not like to fail; their self-concept is tied to a process of carefully building up a cadre of experts in a given field before offering any teaching/learning program in that field. The expected result is an excellent program that will not fail to attract students, and will add to the prestige of the institution. Clearly, this can be a very expensive and slow process, as the academic staff who constitute this cadre of expertise demand a long-term — and therefore expensive — commitment from the university (i.e., a tenured appointment), and they often take years or decades to establish themselves as recognized experts in their field.

As noted previously, continuing education units at universities have been exceptions to the general rule that development of a new university program is a slow and expensive, but almost always successful, undertaking. Known for rapid prototyping and production of new

programs and quick reaction to emerging markets, continuing education units have done this through extensive use of adjunct staff hired on a just-in-time basis, with no expensive long-term commitment. Their quickly conceived and implemented programs often fail, but this failure is inexpensive and becomes evident early, as Christensen's third technique recommends.

This process of failing early and inexpensively has been tolerated by universities as long as their small, marginal continuing education unit operates only at the bottom of the market, particularly in non-degree programs. When there is an attempt to apply this technique at a higher level in the market place, a collision with the core values of the university occurs. A current example at the University of Alberta is an attempt by the Faculty of Extension to do rapid prototyping and production of a new Master of Arts in Communications and Technology (MACT). This is to be a distance-delivered program oriented toward an emerging profession of knowledge workers whose primary preoccupation is the use of technology for internal and external communications in various types of organizations. So new, this profession does not have a name, much less a tradition of university programs to help define it. Therefore, the designing and implementation of a program aimed at this emerging profession will necessarily be a process similar to that employed by the business managers mentioned by Christensen who discovered a market for their new, disruptive product through a process of trial, learning, and trial again.

Since the knowledge workers who constitute this emerging market generally have baccalaureate degrees, any program addressing their needs should logically be a graduate program. However, trying to implement a graduate program at a well-established conventional university through a rapid, iterative process of trial, failure, adjustment of the program, retrial, etc., conflicts with the graduate program approval process; this requires the build-up of a cadre of tenure track staff with proven academic expertise before the program can be offered, not to mention the considerable amount of time consumed in the several stages of the approval process itself. The skunkworks (in this case, the Faculty of Extension) cannot use the "try-fail-adjust-retry" technique recommended by Christensen under this set of conditions laid down by the parent university: it is impossible to build up a permanent, expensive body of on-campus expertise before the outlines of the program become clear, which may only happen after a number of trial offerings in the emerging market, and the long process of program approval may mean that the market opportunity has been lost to another player

before the product is ready. These and other contradictions between what is required for the marketing of a disruptive product and the processes demanded by the established core of the institution may mean that the MACT may never be implemented. This situation, where the autonomy of the skunkworks is compromised by the necessity of having a new product approved according to the rules laid down by the parent institution, illustrates why Christensen's suggestion that disruptive technologies should first be implemented by autonomous units within the overall organization is so important.

In higher education, *serving new client groups* best defines disruptive technologies, and this corresponds closely to Christensen's fourth technique for successful introduction of a disruptive technology, that is, introducing it into a *new market segment*. Perhaps the greatest opportunity to incubate disruptive technologies, and one that is consistent with the mandate and leadership of the continuing studies units, is addressing the continuing professional development (CPD) needs of part-time learners. This client group is not exactly new, as universities have for many years served this need with non-degree programs, but it has always been among the university's "least profitable clients" discussed earlier in this paper. That situation is changing, as demand for CPD is shifting to longer, graduate-level programs. The part-time learner who is already well educated and is willing to pay substantial fees to access a graduate-level program is essentially the basis of a new client group, one that is profitable to the university in both monetary terms and in terms of the intangible rewards that accrue to academic staff who work with graduate students.

Providing CPD learning opportunities to experienced, working professionals presents additional delivery challenges, as compared to those presented by more traditional university students. These clients of the university are less tolerant of passive approaches to learning; for them, learning must be relevant and practical (Cervero, 1990). The challenge in CPD courses is to translate relevant knowledge to practice. Through collaborative learning activities, learners attempt to make sense of the new knowledge within the context of their experiences and workplace. Moreover, these learning activities must be conveniently accessed.

Anderson (1995) provides data suggesting that critical thinking and a community of learners can be created among widely dispersed professionals engaged in audio conference-based distance delivery. There is abundant evidence from many sources (e.g., Bates, 1994) that other forms of distance delivery technologies can also be used effectively in this segment

of the higher education marketplace. If the difficulties with university approval of distance-delivered graduate programs, discussed earlier in this paper, can be surmounted, this relatively new group of clients can also be served through part-time professional Master's degrees that are consistent with the overall goals of the research university.

The fact that distance-delivered CPD programs also have the ability to operate on a cost-recovery basis is a helpful, or even necessary, factor for enticing conventional universities to invest in disruptive technologies for delivery of such programs. CPD is a market segment in which it is possible to serve a new group of clients with little financial risk. Doing this out of a small, semi-autonomous unit such as the Institute for Professional Development at the University of Alberta makes use of all four of Christensen's techniques for dealing with disruptive technologies.

Conclusion

In ignoring disruptive communication and learning technologies, traditional research universities risk sliding into mediocrity and perhaps irrelevancy as far as the teaching function of the university is concerned. As in the corporate environment studied by Christensen, a "retreat upmarket" in response to competitors who have mastered disruptive technologies in the lower segments of the market is not likely to be a successful strategy. These more aggressive institutions will simply expand their teaching/learning operations upmarket as well, eventually leaving only the research function to the traditional research-intensive university. A high-quality teaching/learning function has always been the hallmark of leading universities; an institution that has abandoned the teaching/learning function may, perhaps, be an excellent research institute, but it will not be a university.

Traditional research universities must prepare themselves for changes in the marketplace of higher education by incubating disruptive communication and learning technologies. This is best done in a semi-autonomous unit, such as continuing studies, which can address new markets with low margins.[2] The directors of continuing studies should recognize this opportunity for leadership. Paradoxically, it is also an opportunity for the marginal continuing studies unit to become more integrated into the mainstream of the university. Although continuing studies units have always lived with paradoxes, this should be a creative and invigorating one.

Endnotes

1 The economics of large-scale, distance-delivered programs are completely different, particularly for institutions that do only distance delivery (Daniel, 1996, 1997; Bates, 1994).

2 Moving the incubated innovations from the semi-autonomous, peripheral unit into the main body of the institution is a substantial problem—a subject for another paper.

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