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IT and the Education Industry

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1. INTRODUCTION

One of the main goals of education is to gain the knowledge and skills to address routine problems and tasks outside of a classroom setting. People solve problems and accomplish tasks relying on the resources they have available. Although their personal, physical, and mental resources will always be available, people routinely draw on other assets. These include such things as the knowledge and skills of other people, information from books, and tools such as a hammer and nail. In recent years, information technology has become a routine tool for many people working to solve complex problems and accomplish complex tasks.

The vast magnitude of information stored in libraries and in people's minds continuing to grow at an exponential rate. The complexity of the problems we expect people to solve continues to increase. A high school diploma is no longer considered adequate for many beginning jobs. We expect people to have a higher level of literacy and problem-solving skills. We expect people to have better communication skills and to work together in teams. What we ultimately expect is for people to be lifelong learners.

In response to this rapidly emerging need, information technology has taken the driver's seat, transforming the face of traditional education in distinct ways. By providing useful tools and removing many of the restrictions common to the education industry, IT is dramatically advancing a person's learning capability. No longer do the limitations of who, what, when, where and how apply as they typically have.

2. THE NEED

Our current educational system was designed for the industrial age with its structured hierarchy of drone workers and multiple layers of management. In this industrial age work model, front-line jobs required relatively little education, while the management was expected to do the planning, thinking, and problem solving.

The United States has moved out of the industrial age and into the information age, leaving us with an industrial age educational system trying to cope with the needs of today's civilization. Society is beginning to make the realization that knowledge is power. All employees are expected to plan, think, and work collaboratively to solve problems. Thus, we need an educational system that prepares all students to function at a higher intellectual level. All students need to learn to perform well on their own and as members of a team.

2.1 THE NEED: RISING DEMAND

Changes in technology have spawned new ways of working, new business processes and new ways of delivering education. Within this context of rapid technological change, training and education is seen as an ongoing necessity, enabling workers to remain current with required skills and knowledge.

A number of underlying social, economic and technological forces are coming together to drive demand for continuing education and training. Estimates suggest we are entering a period when the training that workers receive will become obsolete within three to five years.¹

The need for lifelong learning is also reinforced by the frequency with which people change careers. The average person entering the labor market can anticipate six to seven career changes.² Whether to remain employable in their current organizations or to prepare for future opportunities, employees at all levels of organizations value the opportunity to develop their skills and increase their marketability.

Leaders in organizational learning have identified that attracting a well-educated and highly skilled workforce and providing individuals with ongoing training creates the foundation for organizational learning. In line with the information age's decree that knowledge is power,

this has been recognized as an organization's only sustainable, long-term competitive advantage. While workers and their employers value ongoing education and training, people are working more hours and report having less free time to pursue other non-work activities. Harvard University economist Juliet B. Schor, in preparation of her 1991 book *The Overworked American*, used government census and labor data to calculate that the average employee now works 163 more hours, or an extra month per year, than in 1969.

The convergence of these various forces has created a situation in which corporations require employees to learn new skills and acquire new knowledge quickly and continuously. While individuals are motivated to learn for personal and professional development, the logistics of attending classroom education are increasingly difficult to manage. To respond to this situation, corporations, training businesses, and institutions of higher education are looking to information technology to solve many common difficulties. These include attempting to increase the speed, flexibility and reach of training and education, reduce the costs associated with offering classroom training as the only delivery vehicle, and leverage team learning and collaboration for performance and productivity.

2.2 THE NEED: FLEXIBLE ACCESS TO AND DELIVERY

The growing market for continuing education and the market conditions described above have fueled the growth of 'distance learning' options. These new modes of learning are designed to meet the demand for continuing education while providing a range of flexible delivery choices. Corporations, training firms, and institutions of higher education are all exploring these new options.

Within the corporate setting, organizations face a population of learners who are dispersed in terms of time and geography. The costs of training facilities and lost work time contribute to the need for less expensive, more effective solutions. The expertise of instructors is not being utilized to the fullest because of the limited number of learners they can reach using traditional methods. Distance learning options reduce costs of instructor and student travel while leveraging instructor productivity. Corporations are turning to technology for assistance in distributing more flexible educational experiences at a cheaper cost. Technology can deliver learning experiences directly to employees' desks or workstations, eliminating travel and

related expenses. Learning becomes accessible when, and as employees need it, not merely when it is scheduled or an instructor is available.

The cost of technology has at times prohibited widespread use of distance learning, but recent reductions in the cost of hardware and software have lowered that barrier. The huge growth in the installed base of networked and inter-networked computers presents an opportunity now to create an electronic environment for learning any time and any place.

At the university level, we have also been witness the growth in part-time, continuing education. Five million working adults are currently enrolled part-time in colleges and universities in the United States.³ To capture the market of students who cannot attend traditional courses, several universities have embraced distance learning opportunities. In 1995, 75 accredited American university programs offered online degrees.⁴ In addition, several European, Canadian and Australian schools offer courses via TV broadcast, computer conferences, and other technologies to hundreds of thousands of students who cannot be physically on campus.

3. HISTORY: BEGINNING OF THE INFORMATION AGE

Computers and other information technologies have been used in education for some time now. The use of technology in education is multi-faceted. It is a useful and versatile tool; in some instances, technology itself is the subject. It can be used to help solve the problems and accomplish the tasks that are at the center of many different academic disciplines.

Information technologies are often first introduced to classrooms as instructors adopt them to help maintain gradebooks, archive exam questions, prepare individualized education plans (IEPs) for students with disabilities, and word-process lesson plans and class handouts. These increase the instructors' productivity by improving overall efficiency and saving valuable time.

Additionally, many instructors now have the capability to use a desktop presentation system as an aid to interacting with a group or whole class of students. This is a projector system attached to a computer. It can be used to display pre-prepared materials or graphs and other materials that are generated during the interaction between students and the teacher. For example, in a math class, the computer and projection system can be used to create and project a graph of data or a function being explored by the students and the teacher.

Looking further into the technology used in education, we can divide these tools into three categories.

3.1.1 GENERIC

Software programs such as word processors, spreadsheet, database managers, and graphics packages cut across many disciplines. A person who learns to use these tools can apply them in almost every area of intellectual work. The Internet (which includes E-mail and the Web) is a set of generic tools that are proving useful even to students in elementary school. Generic tools, generally packaged with computers or purchased by schools as site licenses, are relatively inexpensive and widely available.

3.1.2 SUBJECT-SPECIFIC

These tools are designed for a particular discipline. Examples include hardware and software to aid in musical composition and performance, mechanical drawing (computer-assisted design), and digital animation. These special-purpose tools tend to be expensive and are generally found in special programs at the university or corporate level.

3.1.3 LEARNER-CENTERED

Learner-centered tools are those used to focus on "learning to learn." Interestingly, the original example is the Logo programming language developed here at MIT. More recently, multimedia and Web authoring software has been used for this purpose. People are able to practice problem-solving and creative strategies as they use the software to create programs and presentations. The main limitation to this use of technology is professional development; teachers need to be proficient with both technology and project-based learning strategies to incorporate computer-based learner-centered activities on a regular basis.

3.2 HISTORY: IT-ASSISTED LEARNING

This section includes three different uses of IT to directly support learning. Computer-assisted learning (CAL) is the interaction between a student and a computer system designed to help the student learn. Computer-assisted research is the use of IT as an aid to doing library and empirical research. Distance learning is the use of telecommunications designed to facilitate student learning.

3.2.1 COMPUTER-ASSISTED LEARNING

Over the past 40 years, CAL has been given many different names, such as computer-based instruction and computer-assisted instruction. The name CAL is intended to emphasize "learning" rather than just "instruction." CAL includes drill and practice, tutorial, simulation, and a variety of virtual reality environments that are designed to help students learn.

Computers have been used for instructional delivery at every age, in every subject area, and with all types of students. Research suggests that CAL is especially useful in special education and in basic skills instruction. Early CAL programs were essentially electronic versions of student worksheets. Current CAL software is highly interactive, able to track and respond to student answers with new problems.

The most technically complex CAL environments are so-called "integrated learning systems" that include tutorials, tests, reference materials, and student tracking software. An ILS system represents a major commitment for a school. The hardware and software costs thousands of

dollars. Having invested in an ILS, a school needs to use the system regularly to achieve measurable learning gains.

3.2.2 COMPUTER-ASSISTED RESEARCH

There are two major categories of computer-assisted research. First, there is the use of computers to read CD-ROM materials and to search electronic databases (the growing "global library") on the Web. Although there are legitimate concerns about monitoring and advising students' as they explore online, computer-assisted research empowers students (and teachers) with increased access to information. With the growing use of electronic databases to store information, electronic search skills are becoming a basic intellectual tool. The second type of computer-assisted research is the use of computerized instrumentation to gather data.

3.2.3 DISTANCE LEARNING

Distance Learning is of rapidly growing use and importance. Through the use of telecommunications, students and instructors can be connected in a two-way audio and a one-way or two-way video network that allows real-time interaction. The Web is increasingly being used to provide the needed connectivity. Often such instruction is not real-time, making use of video tapes or materials stored on a computer, which adds to the convenience of the student. In the typical Web-based course, students interact with each other and the instructors even though they may be located at different places around the world. In addition, CAL and distance education can provide students access to courses that are not available in a teacher-delivered mode in their schools.

3.3 HISTORY: PEOPLE AND TOOLS

Thinking, problem posing (deciding what problems to solve), and understanding the human condition and human values can all be done better by people than by machines. The role of information technology in education is to support these skills; a person who knows how to make effective use of IT has many advantages over a person who does not. IT is of steadily increasing importance in solving the problems and accomplishing tasks in business, industry, research, and government.

4. TECHNOLOGY EDUCATION

Distance learning is any approach to education delivery that replaces the same-time, same-place environment of a traditional classroom.⁵ The principal characteristic of any form of distance learning is that the student does not have to be present in a classroom in order to participate. Distributed learning is a type of distance learning we define as technology-enabled, learning-team focused education, facilitated by a content expert, and delivered anytime, anywhere.

4.1 EDUCATION: ENABLING TECHNOLOGIES

Technology tools developed for distributed learning must support collaboration and facilitate group interaction while allowing flexible delivery.⁶ These technologies need to support all three modes of instruction--Instructor Centered, Learner Centered, and Learning Team Centered--allowing an instructor to mix modes in extended learning experiences.⁷ These technologies must be adaptable both to expand and to replace traditional face-to-face classroom instruction.

Distribution Technologies most often support the Instructor Centered approach along with the information transfer learning objective. These technologies include such things as broadcast TV, audiotape, and videotape. In other words, they support one-to-many communication. The single most popular form of distribution technology for distance education is TV broadcast. Broadcast types of distribution technologies require that the student receive the instruction at a specific time, although they do allow geographic flexibility. These technologies are similar to the traditional face-to-face lecture method in that the student is a passive learner.

Computer-based training (CBT), CD-ROMs and simulations provide anytime, anyplace access, and are most frequently used to support the skill acquisition learning objective with the Learner Centered approach. These technologies are classified as Interactive Technologies. CBT allows students to progress at their own pace through required exercises and self-assessments. CBT is limited in that it does not provide for interaction with other students or an instructor; here the student interacts with only the technology. A few interactive technologies do allow for students to ask questions to and receive answers from an instructor.

The learning objective of Mental Model and Behavior Change in conjunction with Learning Team Centered education are supported by Collaborative Technologies. Collaborative technologies offer a rich, shared, virtual workspace in which interactions occur not between an individual and technology, but as many-to-many communications network among people who share a common goal. These technologies include the use of chat groups and bulletin boards, although these technologies are real-time and require students and instructors to be consistently connected and in constant attendance. Videoconferences can be used to create a virtual classroom that spans geographical distance. On the other hand, they also require same-time interaction and are not supportive of teams needing to collaborate. These examples of collaborative technologies do not enable an instructor to support the most effective, Learning Team Centered approach.

4.2 EDUCATION: DISTRIBUTED LEARNING

The mission of many leading-edge software companies is to develop solutions to business problems that involve the implementation of collaborative information technology as well as organizational and individual behavior change. Distributed learning is a preeminent example of such an opportunity and solution; it must be multidisciplinary and address the market need for any time, any place distance learning with the benefits of the collaborative instructional process. For distributed learning to be effective, it needs to be accompanied by new methods for instructional design, for online teaching and for learning.

Designing and developing courses requires a new approach to instructional design. It requires knowledge of new media, knowledge management practices, models of anytime, anywhere collaboration, and approaches to interweave individual and collaborative team learning in manners appropriate to the content and context.

The role of instructors, teachers and subject matter experts is evolving dramatically to include a focus on facilitating group learning. Online teaching requires new skills and different behaviors from those instructors historically possess. As many organizations look to expand and leverage the knowledge of experts to broader groups of people, it will become increasingly important for these experts to develop online teaching and coaching skills.

Distributed learning presents students with a new way to learn. These new solutions may be used to enhance a face-to-face course or as the sole delivery vehicle for a course during which students never meet face to face.

4.3 EDUCATION: TECHNOLOGY

The quality of distance education depends on technology. Recent improvements in the costs and capabilities of hardware and software, combined with the growth of the World Wide Web and connectivity, encourage the development of new teaching environments. To provide a flexible, collaborative learning experience requires tools that allow learners to access various sources of information in a variety of media and work at their convenience.

Preparing to use these tools requires a shift in education, a movement from a teaching model to a learning model. Instructional design using collaborative technologies must integrate more group work, problem solving, discovery learning and mentoring as the new fundamentals of continuous learning. To successfully implement these new teaching methods, facilitators will need training and support.

Distributed learning allows students to manage their time and learn while interacting with other students and instructors. Students are now presented with new opportunities for professional and personal development. For organizations, distributed learning is a way to increase the speed, flexibility and reach of training and education. It will reduce costs associated with offering classroom training as the only delivery vehicle, leverage an instructor's expertise to a wider population of participants, and leverage team learning and collaboration to change mental models.

5. MARKET RESPONSE

In the United States, there are hundreds of thousands of people who would eagerly pursue higher education, if only they had the time and opportunity.⁸ The good news is that now many reputable colleges and universities are making at least some of their curriculum available to students online. Most of the work can be completed from the comfort of your home or office, and you can usually set your own schedule. At many institutions, it's even possible to earn your entire degree without once setting foot on campus. Online classes are a considerable step up from correspondence schools. Internet bulletin boards function as virtual classrooms for students and teachers who can participate at any time, from anywhere. Instructors post lectures and assignments while students turn in papers and tests and discuss their studies with classmates and professors in online conferences.

Although no one knows exactly how many colleges operate on the Internet, it is clear that many higher-level universities have made it a priority. "This isn't the wave of the future; it's here now," says Terri Hedegaard, vice president of the University of Phoenix's online campus. New York University, California Virtual University, University of Phoenix and Stanford University are just a few of the schools where you do not always have to physically go to class. In many cases, when you complete a degree, it will be the very same diploma the school hands out to its traditional on-campus graduates.

Unlike a traditional classroom, for which a professor creates and delivers each course, the professor becomes more dispensable online after putting the information together in a form that can be sent out again and again. It is even possible for another instructor to answer questions and grade papers.

Spurred by fierce competition for students, colleges and universities are plunging headlong into the rapidly evolving world of online education. A world that barely existed five years ago, it has been only recently that universities have begun to offer whole programs and degrees online, the 1990's version of a correspondence course.

The student body for most online courses is part-time, adult students in continuing education programs or full-time, degree-seeking students who take most of their classes in traditional classrooms. The trend is to make it possible to earn a degree online rather than just take a few

individual classes. Now that Internet education is taking clearer shape, some university officials are willing to take a closer look at the business aspects.

Active marketing is a major component of the NYU plan. Rather than aiming to put all the courses it can on the Web, the university is hoping to start with a dozen or so niche courses that will be attractive to people in industry. As these programs start to bring in revenue, others will be added. "Online is a big, important field in higher education, but it does not have a business model that works," said Gerald Heeger, dean of Continuing and Professional Studies at NYU, who is directing the university's new online enterprise.

5.1 MARKET RESPONSE: UNIVERSITY OF PHOENIX

The University of Phoenix has gained the attention of Wall Street investors and is being praised as the future model of higher education. The largest private university in the United States, it is unique in that it is run as a for-profit business and accepts no one that is not gainfully employed under the age of 23. The university incorporated in Phoenix in 1976 to avoid some of the licensing barriers, has now grown to 111 campuses and learning centers nationwide with nearly 57,400 adult students working toward MBAs or undergraduate degrees. It has another 3,300 students in its accredited San Francisco-based online program. Unlike traditional universities, the University of Phoenix has no campus and holds classes in rented offices. All faculty members are non-tenured and are employed professionals who teach classes related to their jobs during non-business hours. The students are also professionals holding management positions in major companies.

"The real key is that more than 40 percent of people pursuing degrees now are over the age of 24," said Keith Gay, a principal at NationsBanc Montgomery Securities. "These people are working, and they need further education for promotions, but they need flexibility." While some business schools like U.C. Berkeley's Haas School offer night courses to meet that need, most still have a very traditional format that makes it difficult to study and work at the same time. With 50 percent annual growth rates in this program, a course completion rate of 98 percent and a graduation rate of nearly 60 percent online--in comparison to less than 40 percent in most universities--the students clearly like it.⁹

University of Phoenix's online programs start every week, with each \$1,380 class lasting about six weeks. The courses are led by a professor, with online assignments and the requirement of logging in on five of seven days in the week to discuss issues with the other 12 students in the class. "We're filling the need here," Hedegaard said, citing dropping funds for higher education, the high cost of living and a competitive job field that requires adults to keep upgrading their skills to get ahead. "Obviously, it's the same need that the California Virtual University is out there to fill as well."

5.2 MARKET RESPONSE: STANFORD UNIVERSITY

This fall, Stanford University became "the first major research university in the U.S. to offer a master's degree totally online," according to Joseph Goodman, electrical engineering professor there. The MSEE degree program targets industry professionals who otherwise would have to leave their jobs to pursue the degree. By attending classes over the Internet from their desktops, EEs can gain a full-fledged MSEE in as little as one year from one of the most prestigious engineering schools in the country.

Stanford has been offering a variety of courses and programs over the Internet since 1994, some of them for full credit toward a degree. But until now, there were not enough courses to allow a student to obtain an advanced degree. The University of Phoenix offers a master's degree over the Internet, but it is not considered a "research university" on the level of Stanford. Stanford itself has provided 300 companies with short courses, non-credit courses and seminars with a combination of microwave, satellite and two-way digital video technology.¹⁰ Now it's taken the next step with an entirely Internet-based master's program.

The online program will include audiovisual streaming with synchronized slide shows. There will be electronic distribution of class handouts and notes, synchronous and asynchronous interaction between students and instruments, and electronic posting of homework and exams.

Test scores between distance learners and on-campus students have shown little difference, according to Stanford. To compensate for their lack of face-to-face interaction on campus, the virtual students can attend interactive seminars, online discussions and non-credit short courses on telecommunications topics. "In the industrial age, we went to school. In the information age, the school comes to us," said Andy DiPaolo, director of the Stanford Center for Professional Development. "Through Stanford Online, we intend to prove this concept by

making a portion of the graduate engineering curriculum available to qualified students anywhere, any time and on demand."

Stanford expects up to 50 students to sign up for the online degree. The university believes most of the participants will take three to four years to complete the requirements, although it can be done in a year. Thirty courses are offered with as many as 10 to 15 online graduates expected in the first year. A \$450,000 grant from the Alfred P. Sloan Foundation will cover the incremental costs to Stanford for the first two years of the program, but the university expects it to be self-supporting by the third year. Stanford said the cost to the Internet students will be "priced similarly" to existing remotely delivered courses, which are "considerably more expensive" than normal tuition.

5.3 MARKET RESPONSE: CORPORATE EDUCATION

Corporate training programs offer live, online classes with an instructor and other students or independent study in which students work at their own pace. IS departments are slowly coming around to taking advantage of this method of training. Although less than 20 percent of companies currently take advantage of Web-based training, more than 70 percent of respondents to a survey indicated that their companies plan to incorporate Web-based training during the next 12 months.¹¹

Leading the charge to Internet-based training is Global Knowledge Network, working separately with the Canadian government and Microsoft to deliver online technical training. Global Knowledge Network, based in Waltham, Massachusetts, has developed two online training programs that offer a wide range of technical courses. Global Knowledge Network is the primary developer for the Microsoft Online Institute (<http://moli.microsoft.com>) and has worked with the Canadian government to develop a wide-reaching online training center (www.mentys.globalknowledge.ca).

"The advantage of these programs is that I can choose what courses I want to take and when I want to study. I only have to work within my schedule and not someone else's, like I would if I were taking a seminar," says Lola Beckley, a Newfoundland, Canada-based IT consultant, who recently completed a Java course. "The Java material presented here is as good as any offered in seminars," she said. These courses give a good foundation, and if needed, one could pursue further understanding through books and seminars.

6. TRANSFORMATION FACTORS

The education industry just like many others in the last twenty years is facing a changing marketplace, new competition, and new technology that has the potential to transform the industry. New developments in communications have diminished the importance of distance. Frances Cairncross, senior editor of *The Economist*, proposes the "death of distance," a determinant of the cost of communications, will become the single most important economic force to reshape society over the next half century. "In ways dimly imaginable, communications technology will transform ... the institutions of education." ¹²

In conjunction with new technology, the driving factors for change are likely to be higher market demand, changing customer needs, new competition, and decreasing entry barriers.

6.1 EXPANDING MARKET

As discussed earlier in this paper there is a global shortage of professionals educated in science, technology, and management, the demand for higher education surpasses that of any other time in history. Contributing to an expanding market of higher education are Baby boomers and the next wave of echo boomers opting to stay in school for longer periods of time, even after they've already received degrees, making them lifelong clients of the education industry.

6.2 CHANGING CUSTOMER EXPECTATIONS

Today's computer literate, "web savvy", student has higher expectations for the service an educational institution provides. They expect a seamless integrated electronic service that can meet all their needs. In the past, and currently, many institutions electronic services have been impersonal, unreliable, difficult to use, divided, and not easily accessible.

The standard for ease of use is higher than ever before. Users have become accustomed to intuitive transparent interfaces requiring little or no knowledge from the user. Point and click and graphical user interfaces have permanently replaced command lines with high learning curves.

6.3 NEW TECHNOLOGY

Research indicates that the best learning environment is a great tutor working with an individual learner. George Brackett, faculty at the Harvard School of Education, proposes that in order to learn people need a tutorial cycle which (at a minimum)¹³:

- presents information;
- elicits action from the learner (asks questions);
- assesses the learners action response;
- provides feedback (knowledge of results);
- offers guidance (strategies, hints);
- manages the process.

Can these requirements be met by educational software? Yes, indeed.

Technology has reached a point where it can develop substitutes that rival traditional courses, albeit in a different instructional model. Telecommunication and multimedia can facilitate new teaching and learning styles. No longer bound to traditional didactic teaching, with coached practice, and Socratic dialog, teaching in cyberspace is replaced with student directed learning, where the learner actively pulls knowledge instead than passively receiving it from an instructor. Listening passively is replaced with goal oriented learning where the learner navigates the knowledge space non-linearly in a manner that matches his/her learning style.

The first groups of courses being replaced are the introductory undergraduates ones, like introductory physics, chemistry, and math. Typically, these courses are well defined, have been taught for many years, the content does not change, and they are already taught in a non traditional manner, enormous lecture halls with several hundred students.

The cost of developing electronic courses and appropriate software is holding many education programs from venturing into this new arena. It is estimated that creating a high quality software package to replace a course costs about 3 million dollars, with an additional half a million a year in maintenance.¹⁴ However, as technology improves and the course creation is automated the development price will drop. “Out of the box” solutions are in the works in several software companies, to name a few: Microsoft, RealNetworks, Oracle, Lotus, and others.

6.4 NEW COMPETITION

Catering to the working professional a new breed of players have entered the education industry. They have applied savvy business strategies such as convenience, customer service, mass production, and corporate partnerships to gain a competitive edge.

The structure of the new programs is revolutionary compared to that of traditional educational institutions. The curricula are lean, reducing the time of graduation. The academic term cycles are shorter, so students can start study programs with out much delay. Schedules have been moved from day to night and from the classroom to cyberspace to accommodate work schedules. The content of classes emphasizes practical aspects, thought by working professionals instead of career college professors.

These new universities enjoy higher profit margins due to minimized overhead. The traditional campus has been replaced with rented office space. Also, since the faculty is not composed of professors, there are no teaching career issues, there is no tenure concept and none of the administrative difficulties associated with the management of university professors.

Economies of scale are leveraged to develop courses and curriculums for mass production. Teaching methods, handouts, textbooks, problem sets, examinations, and syllabi are standardized and implemented across all campuses.

Not surprisingly, several new players, promising faster training and education, have attracted corporate customers. The University of Phoenix, the star of the new breed, has as clients Kodak, IBM, AT&T, and General Electric.

6.5 DECREASING ENTRY BARRIERS

The Department of Education is considering a congressional proposal that would lift restrictions on distance learning programs, making them eligible for federal funding. Such a move would shift the rules of the game. It would give new entrants sources of funding and increase buying power for nontraditional students. "Nontraditional" students in this case could be those who take classes via the Internet from online universities.

New technology removes two other barriers to entry. Online universities can forgo the millions of dollars needed to buy a physical campus; all they need is a presence in cyberspace. A second advantage of the online university is each professor can reach “n” students.

7. RESEARCH UNIVERSITIES

During the Second World War the U.S. Federal Government recognized the important role of federally supported research and the maintenance of a strong national research capability. This philosophy continued through out the cold war. However, with the fall of the Berlin wall and the collapse of the Soviet Union these funding premises are no longer true.

The trends that are now in place point to a dramatically different world, a world in which research universities must re-examine and enlarge their core mission. Research funding is anticipated to decline 20% in real dollars by the end of the century.¹⁵ Research universities that want at least to sustain if not increase research support will have to look elsewhere, most notably the private sector, for increased research funding. For-profit corporations in turn will pursue true value added from university partnerships; they will no longer be content with solely altruistic relationships.

To survive and to solve the increasingly complex crisis of overhead containment, research universities need a growth strategy going forward into the next century. Some of the first attempts come from prestigious research universities like Stanford and Johns Hopkins. Earlier this year, Stanford University became the first major research university in the U.S. to offer a master's degree completely online. Also, Johns Hopkins University, is teaming with the Caliber Learning Network, a joint venture of MCI Communications and Sylvan Learning Systems, to offer degrees in the business of medicine.

8. HEALTH INDUSTRY PARALLELS?

A Coopers & Lybrand white paper¹⁶ released last may describes the Internet and new technology as creating a "massive, structural change in the higher education industry." The report likens the university system to the pre-HMO health-care industry and says it's ripe for rationalization: "Instructional software could easily substitute for campus-based instruction, or at least be a substantial part of the delivery system."

The health care industry used to be a growth industry partially subsidized by the government. In the old health care system, parallels can be drawn between physicians and university faculty. Then came the health care revolution and the structure of healthcare changed entirely. Controlling groups were consolidated and parts of the healthcare industry partnered with for-profit companies. Today the surviving groups drive the marketplace and set performance standards.

It will be interesting to see if education follows the same trend. The opportunities to partner with for-profit groups are currently presenting themselves to academia. Consortiums, partnering several educational institutions with for-profit corporations are already taking place.

8.1 FIRST WINNERS

The first winners in the health care industry were large, low cost providers. Certainly the opportunity for large state owned universities systems, with multiple campuses, to pool resources and reduce its operational costs exists. However, only time will tell if the parallels hold.

9. THE FUTURE IS HERE

For-profit corporations have discovered that colleges and universities control valuable assets: knowledge, skills, and people. Business is willing to pay for access to these assets, and the early indications are that some higher-education institutions will enjoy substantial new revenues. Proceeds will come from marketing courses to new, wider markets, by developing new communications and information technology products, by exploiting their brand names, and even by promoting faculty members as consultants. For many, these new deals will even enhance traditional missions.

As promising as these prospects are, several efforts have failed to materialize. This summer one of the most ambitious deals to date fell apart. The California Educational Technology Initiative (CETI) was a partnership between the California State University system (CSU) and four technology giants: GTE, Fujitsu, Hughes, and Microsoft.¹⁷ Had the partnership materialized, it would have poured \$300 million into rebuilding the system's outmoded information infrastructure. Just as important, it would have created a for-profit entity capable of carrying CSU's courses to a wider audience, improving the efficiency of administrative

services, making the university a supplier of technology and services in the region and channeling substantial revenues into the university. Those, at least, were the prospects its administrators had envisioned.

Slowly but surely CETI fell apart, there were many contributing factors but the main problem was one of control and ownership of assets. CSU made many invalid assumptions on:

- Ownership of courses
- Marketing to student body
- Selling unused bandwidth
- Product testing on students
- Flexibility of faculty
- Privacy

This early example brings to light that even though the business opportunities and technology are here, traditional educational institutions still have many internal issues that must be solved before moving forward. In the university culture, often, only the gradual process of achieving consensus may answer many of the difficult questions (i.e. course ownership). Institutions looking to venture in the for-profit world must start the internal process of discovery and negotiation now.

10. CONSIDERATIONS MOVING INTO THE FUTURE

One thing is for sure; higher education is changing rapidly. The extent and direction of this change remains to be seen but universities, just as for-profit corporations, must prepare for change and manage for it.

To follow is a list of considerations the education industry should consider as it prepares for the future (some of the considerations were presented in the Coopers & Lybrand white paper).

- Partnerships and alliances
- Market and strategy
- Technology
- Human resources
- Students services

10.1 PARTNERSHIPS AND ALLIANCES

Opportunities to form alliances and partnerships will come from other institutions and for-profit corporations. Partnerships with other educational institutions to serve a specific corporate client are some of the first ventures. As educational institutions come together some of the logistical issues they face are:

- Royalty and intellectual property issues
- Customer requirements from industry
- Sales issues
- Program management
- Admission policies
- Information infrastructure for project, courses, workflow
- Will the alliance form a new entity? If not, will management be centralized or decentralized. If yes, what is the organization of new entity, royalty issues.
- Will each institution grant its own degree?

10.2 MARKET AND STRATEGY

Education administrators must keep their finger on the pulse of the education industry and manage for change. They must examine their strategies and make sure their assumptions on markets, customers, suppliers, competition, core-competencies, mission, and technology still hold true. When conditions change administrators must react accordingly and modify their strategy.

Intrepid universities will treat distance education and its supporting technology as part of their overall strategy. Distance education can now be viewed as more than an add-on or an adjunct activity for a minority of university participants, but rather as a new core activity that enhances all three core activities: on campus teaching, on-campus research, and beyond-campus learning and collaboration.

10.3 TECHNOLOGY

One of the fastest changing industries is the IT industry, hence, educational institutions must pay special attention to IT and to the impact it can have in the industry of education. Furthermore, technology initiatives should be aligned/realigned with the institutional strategy and mission and evaluated on a regular basis.

Administrators should make sure IT is current enough to attract students, faculty, and staff. The IT infrastructure should provide support for course materials, classrooms, libraries, computer labs, academic departments, and other functions or processes that support the institutions strategy and mission.

10.4 HUMAN RESOURCES

Human resources should maintain, procure, and develop personnel with the capability to support the business and/or IT strategy.

In order for distance education to have a chance the faculty of educational institutions must first embrace it. Without this support efforts are apt to fail miserably. Hence, administrators must build incentive programs and reward structures to promote acceptance. They must also, establish a fair and equitable policy on intellectual property rights for educational materials that are digitized and made widely available.

Faculty must also be trained in the new technology and more importantly how to effectively teach in cyberspace.

10.5 STUDENT SERVICES

Educational institutions should strive for ease of use, one stop, and convenient student services. Staff and faculty should be empowered so they can resolve students needs in one stop. Resources should be allocated to the activities that are most highly valued by students and most contribute to retention and overall satisfaction.

As more students services go online an opportunity exists to improve customer service by capturing information about the way students use the system, how they respond to services, and what is important to them. Student data can be "mined" in an analogous way to commercial data mining. The information produced can be used to provide better customer service, target their customers, and get a competitive edge.

Data mining might also have an academic impact. As academic work time in front of a computer increases, an integrated system can start to gain insight into students' learning styles and study habits. The insight gained can be used to develop more efficient computer related course materials and structure more capable learning activities.

11. CONCLUSION

Change is imminent, clearly the digital age will transform higher education as it has already transformed other industries. What will education look like the future? No one can tell for sure. However, it is imperative that administrators prepare for the future, plan for change and manage for it. Also, as mentioned on the last section they must consider partnerships, strategy, technology, human resources, and student services.

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