

**Evolution of the University Business Model and Infrastructure
Planning Due to Technological Innovations**

by

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B.S. Ateneo de Manila University, 1997

Submitted to the Alfred P. Sloan School of Management
in Partial Fulfillment of the Requirements for the Degree of
Master of Science in the Management of Technology
at the
Massachusetts Institute of Technology

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ABSTRACT

The quality of higher education has been a growing concern in the United States and United Kingdom. There have been no notable improvements in the education system until the last few years. Considerable transformation in the higher education arena has begun to take place in step with the shift of industries from manufacturing to knowledge-based. The competitive environment has altered and paved the way for new entrants to successfully emerge and offer more educational options to students.

This research will discuss the factors that may influence the wave of higher education learning in the near future. Various technological research and initiatives led by the National Science Foundation, Department of Energy, NASA and other organizations highly contribute to the technological advancements in distance learning and other interactive learning modes. Faculty will play an important role in the progress of non-traditional learning approaches as they continue to experiment and work on the available technologies.

Established institutions in higher education maintain many traditions and invest a lot of resources to continuously improve their current processes. New entrants cater the needs of a different type of market composed of working adults and students who seek to learn specific skills and improve their employability. They employ a different type of business model that might prove to be disruptive. The new institutions have begun to invade the market of established institutions that have difficulty switching to new technologies and teaching methods due to the rigidities experienced in their organizations.

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Chapter I. Introduction

How much are university's business models different from corporations? Professor David Collis of Harvard Business School examined the dynamics of higher education by using Michael Porter's Five Forces framework. A sixth force has recently been added to the framework and is applied to his analysis and study as well. The Five Forces framework allows us to assess the competitiveness of an industry and helps identify the competitive advantage of institutions and companies. The study may string out the elements that heightens or weakens competitiveness in the industry. The figure below (Figure 1) illustrates the factors used in the framework.

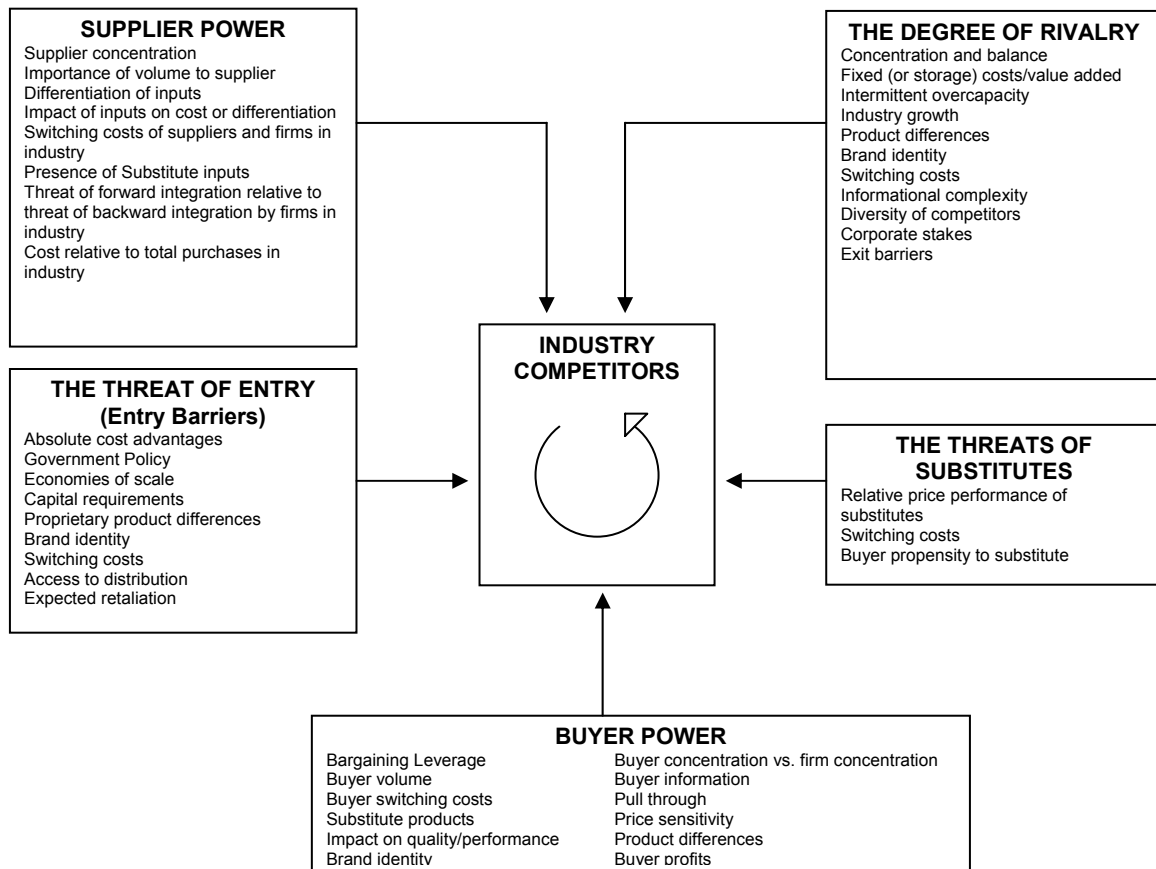


Figure 1. Elements of industry structure

“Industry analysis begins from the premise that all industries create value.” Porter’s Five Forces tries to capture two things: the amount of value that an industry can create which pertains to the size of the pie and the parties that capture the value that is created or the dimension of the pie. The three forces that comprise the analysis of the size of the pie are: (1) threat of entry; (2) threat of substitutes and; (3) presence of complements. The rest of the three forces that affect the division of the pie are (4) powers of buyers; (5) power of suppliers and; (6) extent of rivalry.

The industry analysis will hopefully aid higher education institutions to understand the underlying factors that may change the competition in an industry. It will extremely be helpful for institutions to know and understand the dynamics of these factors so that they can determine their strategies accordingly.

In the past, the establishment of higher education institutions seems to be quite challenging. Barriers to entry were high since a lot of capital was required to build a physical campus and gain a solid reputation to attract a considerable number of students and justify operations. Substitutes were not readily available since employability of people required a college degree for the most part. It was impossible for students to earn a degree in high school and vocational schools. Plenty of complements spurted out as “growth of employment and cultural opportunities” became available for staff, students and faculty.

Looking into the forces that build on the dimension of the pie, experts agreed that buyer power was low. Tuition fee hikes could not be controlled and negotiated by parents and students due to little presence of substitutes. Further, there was a strong mentality that directly correlates the quality of universities with the fees they command. The power of

suppliers (pertains to the faculty) was low since career options outside of academics for these professors were not widely available and not as attractive. Finally, rivalry was low as regulations regarding education institutions were managed to control excessive competition.

We can surmise that the higher education industry in the past was not as highly competitive as it is now since institutions were able to raise and command higher tuition rates annually. It was also very rare to find institutions go bankrupt and therefore shut down operations and exit the industry. Most of the challenges experienced in the industry revolved around internal affairs without much threat from external competitors. However, with the movement of society from the Industrial Age towards the Information Age, the higher education industry has gradually been experiencing a rise in external competition and threats as knowledge plays a more vital role in new service and research and development entities today.

Universities must remain dynamic to make sure that the education that it provides remain relevant to the current events. Three major changes were noticeable after the cold war: (1) Emphasis towards economic change and international competitiveness; (2) Nationwide local interest with nation-state national interest; and (3) Towards the production of experts which is essential to national foreign policy. ¹

There is a very strong awareness of the education industry's contribution to a country's economy especially in the United States and United Kingdom. The education sector has also been considered as part of the export industry as thousands and thousands of students from abroad enter the US and UK to study. The thesis will further explore the initial analysis of the industry and delve into the challenges that are met as a result of the

changes occurring. Higher education institutions have constantly worked on raising the quality and effectiveness of distance education in their commitment to provide quality education to the population. Distance learning is not all about achieving economies of scale. Society and government play very important roles in shaping the higher education industry today. Demand and needs are evolving as more resources become available and society is more fully ingrained in globalization.

Chapter II. Facts and Figures

A. United States of America

The Carnegie Classification categorizes all higher education institutions that are degree-granting and recognized by an agency in the U.S. Secretary of Education. These institutions belong to one of the following six major categories:

1. **Doctorate-granting Institutions:** These institutions offer a wide range of baccalaureate programs and graduate education through the doctorate.
 - A. Doctoral/Research Institutions --- Extensive: They award at least 50 doctoral degrees per year across at least 15 disciplines.
 - B. Doctoral/Research Institutions --- Intensive: These institutions award at least 20 doctoral degrees per year across 3 or more disciplines.
2. **Master's Colleges and Universities:** These institutions usually offer baccalaureate programs and graduate education through the master's degree.
 - A. Master's Colleges and Universities I: They awarded at least 40 master's degree per year across three or more disciplines.
 - B. Master's Colleges and Universities II: These institutions awarded at least 20 master's degree per year.
3. **Baccalaureate Colleges:** These are primarily undergraduate colleges that offer extensive baccalaureate programs.
 - A. Liberal Arts: They award at least half of their baccalaureate degrees in the fields of liberal arts.

B. **General:** They award less than half of their baccalaureate degrees in the liberal arts field.

C. **Baccalaureate/Associate's Colleges:** These institutions award bachelor's degrees that account for at least ten percent of the undergraduate awards.

Majority of its awards comprise of associate's degrees and certificates.

4. **Associate's Colleges:** These institutions offer associate's degree and certificate programs and offer few or no baccalaureate degrees at all. These colleges include community and technical colleges. The bachelor's degree awarded to students per year is less than ten percent of the total undergraduate awards.

5. **Specialized Institutions:** These institutions typically focus on a single field. The degrees offered range from bachelor's to doctorate. Examples of these institutions include theological seminaries and other specialized faith-related institutions, medical schools and medical centers, schools of engineering and technology and schools of law.

6. **Tribal Colleges and Universities:** These institutions are mostly located on reservations and tribally controlled where all are members of the American Indian Higher Education Consortium.

It is important to assess the current situation of higher education where we can try to simulate a trend that had been brewing in the past years. Not-for-profit institutions account for 42 or 43 percent of the total institution universe while 16% is comprised of for-profit institutions. The rest of the institutions are owned by the government and therefore managed by the public.² For-profit institutions are more common in the Associate's Colleges (29%), specialized institutions (62%), schools of business and management

(31%) and schools of arts, music and design (29%). It is notable to mention that the number of institutions in each of the categories has grown in a more or less uniform manner except for the sharp decrease of Baccalaureate colleges from 1973 to 2000. The industry has experienced closing of some colleges as well as consolidation of institutions. However, many of the changes are attributable to the growing market for master's level training. Noticeable increase in the number of Associate's Colleges and two-year colleges over the years indicate that more and more programs and short courses are now offered to the community (Table 1). The Two-year and Associate's Colleges comprise 42% of the total number of higher education institutions in the US (Figure 2).

The increase in the number of Associate's Colleges has been complemented well with the larger number of enrollments in Associate's Colleges when compared to the Baccalaureate colleges (Table 2). Looking at the Figure 3, the number of enrollment by students over 22 years old seems to have flattened until 2012 where it will start to increase again. The trend shows that at least a five-percent increase in enrollment has been reported in the various degree-granting institutions in the US.

It is also important to understand the difference in the distribution of the sources of fund revenue between the public and private institutions. Figures 4 and 5 clearly illustrate how institutions depend largely on external funds other than tuition to run and manage the institutions. Public institutions receive a considerable amount from the state government and sales and services while private institutions rely on investment returns and educational activities for revenue. Private sources is 15.6% of a private institutions total funds while only 4.8% of a public institution's fund come from private sources. Funds from the federal

government are comparable in both types of institutions. Tuition contributes to at the most one fourth of the total revenue in private institutions and only 18.5% in public institutions.

TABLE 5 DISTRIBUTION OF HIGHER EDUCATION INSTITUTIONS
BY CARNEGIE CLASSIFICATION: 1973–2000

| CATEGORY ¹ | NUMBER | | | | | PERCENT | | | | |
|---|------------|------------|------------|-------------------|------------|-------------|-------------|-------------|-------------------|-------------|
| | 1973 | 1976 | 1987 | 1994 ² | 2000 | 1973 | 1976 | 1987 | 1994 ² | 2000 |
| Total | 2,837 | 3,072 | 3,389 | 3,596 | 3,941 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Doctoral/Research Universities | <i>173</i> | <i>184</i> | <i>213</i> | <i>236</i> | <i>261</i> | <i>6.1</i> | <i>6.0</i> | <i>6.3</i> | <i>6.6</i> | <i>6.6</i> |
| Research I & II, | | | | | | | | | | |
| Doctoral/Research—Extensive | 92 | 98 | 104 | 126 | 151 | 3.2 | 3.2 | 3.1 | 3.5 | 3.8 |
| Doctoral I & II, | | | | | | | | | | |
| Doctoral/Research—Intensive | 81 | 86 | 109 | 110 | 110 | 2.9 | 2.8 | 3.2 | 3.1 | 2.8 |
| Master's Colleges and Universities | <i>456</i> | <i>594</i> | <i>595</i> | <i>533</i> | <i>611</i> | <i>16.1</i> | <i>19.3</i> | <i>17.6</i> | <i>14.8</i> | <i>15.5</i> |
| Comprehensive I, Master's I | 323 | 381 | 424 | 439 | 496 | 11.4 | 12.4 | 12.5 | 12.2 | 12.6 |
| Comprehensive II, Master's II | 133 | 213 | 171 | 94 | 115 | 4.7 | 6.9 | 5.0 | 2.6 | 2.9 |
| Baccalaureate Colleges | <i>721</i> | <i>583</i> | <i>572</i> | <i>645</i> | <i>606</i> | <i>25.4</i> | <i>19.0</i> | <i>16.9</i> | <i>17.9</i> | <i>15.4</i> |
| Liberal Arts I, Baccalaureate I, | | | | | | | | | | |
| Baccalaureate—Liberal Arts | 146 | 123 | 142 | 165 | 228 | 5.1 | 4.0 | 4.2 | 4.6 | 5.8 |
| Liberal Arts II, Baccalaureate II, | | | | | | | | | | |
| Baccalaureate—General & | | | | | | | | | | |
| Baccalaureate/Associate's Colleges | 575 | 460 | 430 | 480 | 378 | 20.3 | 15.0 | 12.7 | 13.3 | 9.6 |
| Two-year, Associate of Arts, Associate's Colleges | 1,063 | 1,146 | 1,367 | 1,463 | 1,669 | 37.5 | 37.3 | 40.3 | 40.7 | 42.3 |
| Specialized Institutions | 424 | 559 | 642 | 690 | 766 | 14.9 | 18.2 | 18.9 | 19.2 | 19.4 |
| Institutions for Nontraditional Study | — | 6 | — | — | — | — | 0.2 | — | — | — |
| Tribal Colleges and Universities | — | — | — | 29 | 28 | — | — | — | 0.8 | 0.7 |

NOTES: Figures in italics are aggregated from subcategories. Percentage details may not sum to totals due to rounding.

¹ Category labels and definitions varied from one edition to the next. Not all categories are comparable over time.

² Figures for 1994 differ slightly from those previously published, reflecting revisions made in 1997.

—Not applicable.

Table 1. Distribution of Higher Education Institutions Source: Carnegie Classification 2000

TABLE 6 ENROLLMENT IN INSTITUTIONS OF HIGHER EDUCATION, BY 2000 CARNEGIE CLASSIFICATION: FALL 1998

| CATEGORY | AVERAGE | MEDIAN | CATEGORY TOTAL | PERCENTAGE DISTRIBUTION |
|--|---------------|---------------|------------------|-------------------------|
| Total | 3,961 | 1,617 | 15,079,149 | 100.0 |
| Doctoral/Research Universities | <i>16,258</i> | <i>14,319</i> | <i>4,243,433</i> | <i>28.1</i> |
| Doctoral/Research Universities—Extensive | 20,672 | 20,016 | 3,121,462 | 20.7 |
| Doctoral/Research Universities—Intensive | 10,200 | 8,917 | 1,121,971 | 7.4 |
| Master's Colleges and Universities | 5,288 | 3,865 | 3,230,842 | 21.4 |
| Master's Colleges and Universities I | 5,962 | 4,801 | 2,957,127 | 19.6 |
| Master's Colleges and Universities II | 2,380 | 1,932 | 273,715 | 1.8 |
| Baccalaureate Colleges | 1,729 | 1,322 | 1,039,020 | 6.9 |
| Baccalaureate Colleges—Liberal Arts | 1,651 | 1,436 | 373,138 | 2.5 |
| Baccalaureate Colleges—General | 1,682 | 1,272 | 536,543 | 3.6 |
| Baccalaureate/Associate's Colleges | 2,309 | 1,083 | 129,339 | 0.9 |
| Associate's Colleges* | 3,785 | 1,681 | 6,041,946 | 40.1 |
| Specialized Institutions | 715 | 349 | 510,703 | 3.4 |
| Tribal Colleges and Universities | 530 | 369 | 13,253 | 0.1 |

SOURCE: National Center for Education Statistics, Integrated Postsecondary Education Data System.

NOTES: Enrollment data were not available for a small number of institutions (see appendix for cell sizes). Figures in italics are aggregated from subcategories. Percentage details may not sum to totals due to rounding.

*One Associate's College showed enrollment of zero, and one showed enrollment of 384,002. Excluding these institutions, the category average is 3,550.

Table 2. Enrollment in Higher Education Source: 2000 Carnegie Classification

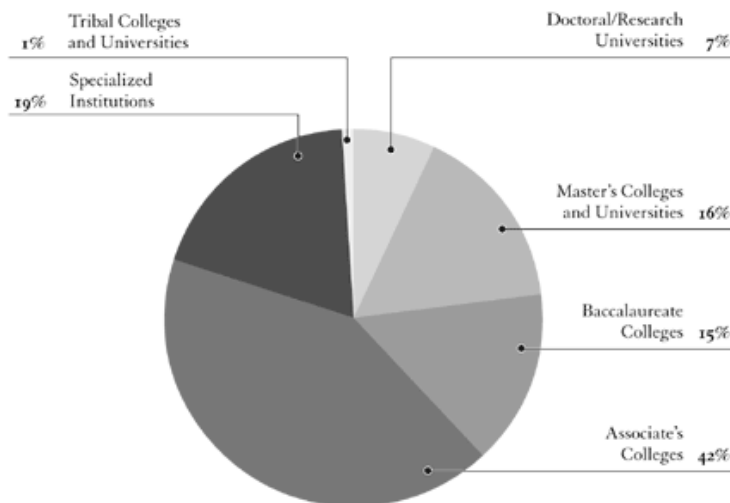


Figure 2. Percentage Distribution of Higher Education Institutions by 2000 Carnegie Classification

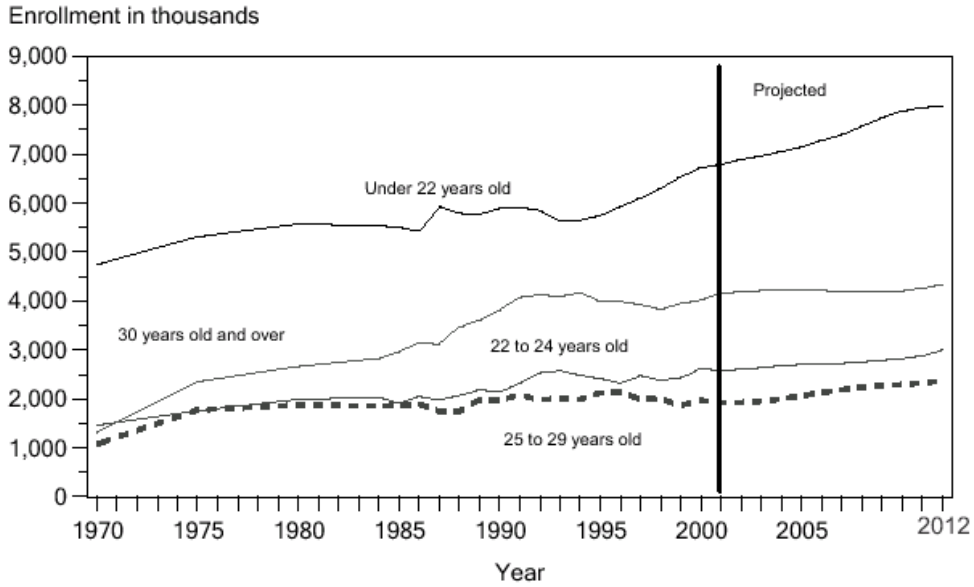


Figure 3. Enrollment in degree-granting institutions, by age: Fall 1970 to fall 2012

Source: U.S. Department of Education, National Center for Education Statistics, Higher Education General Information Survey (HEGIS)

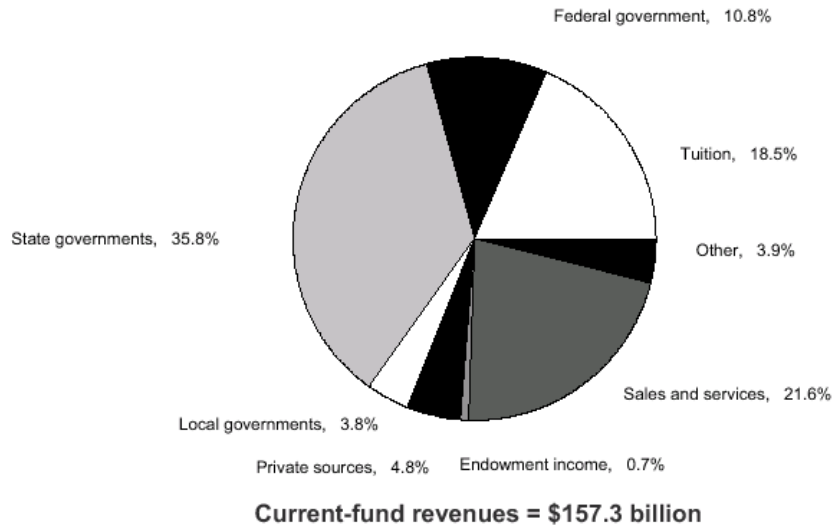


Figure 4. Sources of current-fund revenue for public degree-granting institutions: 1999-2000

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), "Finance FY2000" survey.

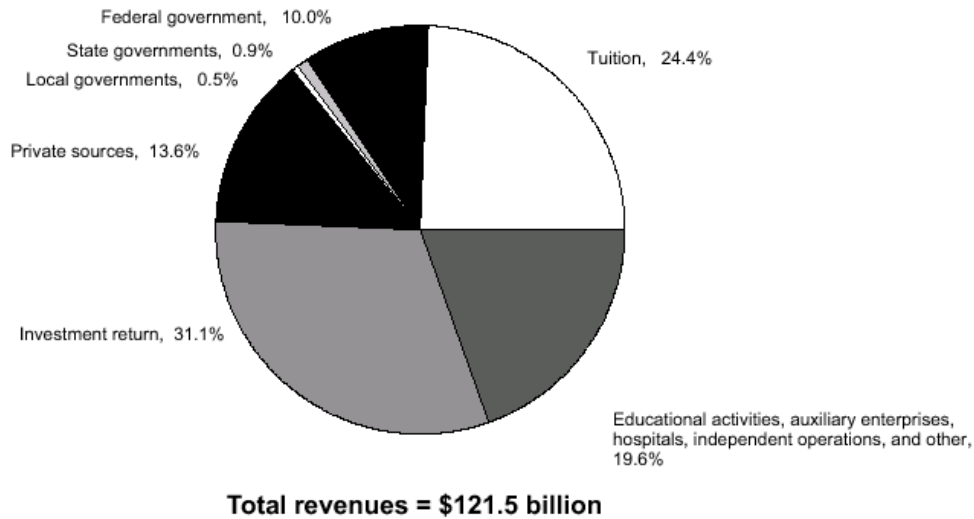


Figure 5. Sources of total revenue for private not-for-profit degree-granting institutions: 1999-2000
 SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), "Finance, FY2000" survey.

B. United Kingdom

The real challenge of UK universities lies in their ability to educate at least 50% of their age 18-22 population. They foresee the significance of educating the UK population to remain globally competitive in the future as the world moves towards a more knowledge-based environment. Foundation degrees that focus on specific skills employees really need will be pushed by the government. At the same time, continued efforts to entice students to apply for these degrees through financial incentives will be applied. Additional funding will be provided for the degrees offered by Further Education Colleges. The government will highly encourage universities and colleges to develop and offer flexible options. This will hopefully meet the diverse needs of the population and improve support for part-time students, development of “2+” arrangements, credit transfer and e-learning.

United Kingdom is divided into four jurisdictions: England, Wales, Northern Ireland and Scotland (Table 3). Each jurisdiction applies different funding arrangement and

is quite independent from the others. There are currently more institutions located in England (almost 70%) than in any of the three jurisdictions. Real coordination regarding academic activity on a national level can only be attained in each jurisdiction. UK is a small country and has universities that are physically located 200 or 300 yards of each other. To site an example, there is a street in Manchester that holds three universities located within half a mile of each other. These universities are completely independent and share little or no infrastructure. From this example, we can imagine how difficult it would be to attain a tight level of coordination among all UK universities.

The University of Buckingham is the only private university in the UK. The rest of the universities are managed by a privy council, an advisory council to the queen led by the Chancellor. The actual day-to-day manager of the university though is the Vice Chancellor who is usually someone who had a career as an administrator in the government.

UK higher education institutions are classified as Universities, University Institutions and Colleges of Higher Education. Although not officially classified as so, universities and colleges are also defined under three layers of academic prestige.

1. **Raffles Group:** The top layer consists of 19 universities that regularly meet in the Raffles Hotel in London. The Raffles group enjoys an elevated status and is equivalent to the Ivy League universities of the US.
2. **Red Brick Universities:** The second layer is referred to as the Red Brick Universities for universities that were founded 50 or more years ago. These universities are relatively small and are located in provincial towns.
3. **Post 1992 Universities:** The last layer pertains to the Post 1992 universities that consist of polytechnic institutes that eventually gained university status.

Majority of the expenditures of higher education institutions are comprise of staff and instructional costs (Figure 6). 39% of the funds are received from the Federal Councils while endowments and other special gifts are almost none. UK universities are also known for providing quality research and receive a bulk of the funds from research sponsors and industries. The institutions are more geared towards the formation of tighter and stronger relationships with the different firms in industries through research services and technology and knowledge transfer initiatives.

Many of UK's students who are pursuing other undergraduate or post graduate degrees after earning their first degree study on a part-time basis. Most of these part-time students are working full-time but have decided to pursuer other degrees to increase their competitiveness in the job market as they aspire for higher positions in companies. Compared to other EU nations, UK boasts of a higher number of students pursuing higher education. This number is still considered low by UK where only 40% of the population pursues higher education degrees. Aware of the economic impact of higher education to the country (Figure 6), the government has directed a large portion of its budget towards the improvement of the institutions for higher efficiency and higher quality of education. Immense efforts are placed to allow fair access of the institutions to all students wherein unaffordable high school fees should not deter them from attending universities.

NUMBER OF INSTITUTIONS (AS AT AUGUST 2003)

| | Universities* | University Institutions | Colleges of HE | Total |
|------------------|---------------|-------------------------|----------------|-------|
| England | 73 | 92 | 42 | 134 |
| Scotland | 13 | 13 | 7 | 20 |
| Wales | 2 | 9 | 4 | 13 |
| Northern Ireland | 2 | 2 | 2 | 4 |
| United Kingdom | 90 | 116 | 55 | 171 |

*Includes University of Buckingham.

There are 116 university institutions in the UK, counting separately the colleges of Wales and London. If Wales and London are counted as single institutions, the total is 90.

There are also higher education students studying at a number of further education colleges.

Source: Universities UK

Table 3. Higher Education Institutions in the UK. Source Universities U.K.

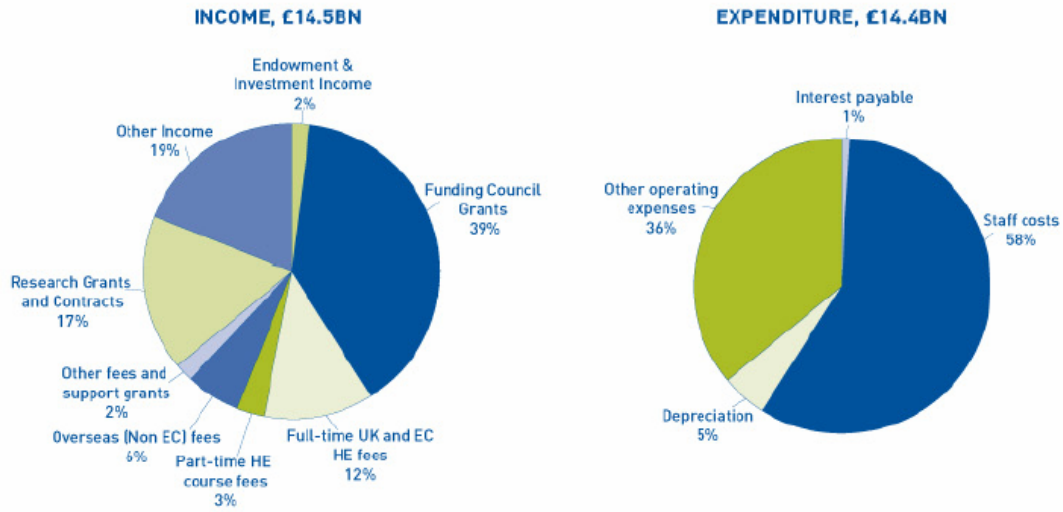
| HIGHER EDUCATION FULL-TIME AND PART-TIME STUDENTS - 2001/02 | | | |
|---|------------|-----------|--------------|
| Thousands | | | |
| | Full-time* | Part-time | All students |
| First degree | | | |
| UK | 848.6 | 103.2 | 951.8 |
| Other EU | 40.6 | 2.2 | 42.8 |
| Other overseas | 50.7 | 3.5 | 54.2 |
| Total | 939.9 | 108.9 | 1,048.8 |
| Other undergraduate | | | |
| UK | 115.0 | 427.1 | 542.1 |
| Other EU | 3.9 | 4.7 | 8.7 |
| Other overseas | 10.4 | 6.2 | 16.6 |
| Total | 129.3 | 438.0 | 567.4 |
| Postgraduate | | | |
| UK | 106.3 | 243.1 | 349.4 |
| Other EU | 24.6 | 14.0 | 38.6 |
| Other overseas | 55.4 | 26.4 | 81.8 |
| Total | 186.3 | 283.5 | 469.8 |
| All students | | | |
| UK | 1,069.9 | 773.4 | 1,843.3 |
| Other EU | 69.2 | 21.0 | 90.1 |
| Other overseas | 116.5 | 36.2 | 152.6 |
| Total | 1,255.6 | 830.5 | 2,086.1 |

*Full-time and sandwich course students and those on a study-related year out.
 Note: these figures are presented on a different basis to those in the Autumn 2002 leaflet.
 Source: HESA Students in HE Institutions 2001/02

Table 4. UK Higher Education Students

Source: Universities UK

INCOME AND EXPENDITURE OF UK HEIs, 2001/02



Source: HESA

Figure 6. Income and Expenditure of UK HEIs

Source: Universities UK

ECONOMIC IMPACT OF HE INSTITUTIONS (HEIs) IN 1999/00

HEIs employed 345,000 people - 1.4% of total UK employment.

For every 100 jobs in HEIs 89 other jobs generated in rest of economy.

For every £1 million of HEI output £1.56 million generated in rest of economy.

UK HE sector generated £34.8 billion of output.

HE sector's gross export earnings £2.7 billion.

Source: *The Impact of higher education institutions on the UK economy*, Universities UK, May 2002

Figure 7. Economic Impact of HEIs in the UK

Source: Universities UK

CHAPTER III. Distinct Business Models of Higher Education Institutions

How are business models applicable to higher education institutions? If some people believe that universities can be managed and run like traditional service companies, does it mean that business models of companies can easily be applicable to university business models?

All companies whether big or small are directed by their business models. These business models might have been formally documented on paper or shared through word of mouth. Business models allow company owners and managers to illustrate their vision through a roadmap or plan that can be understood and shared by everyone involved in the company. Value creation and value realization are both tackled in business models where short-term financial profitability and long-term vision and value are deemed as equally significant to the success of the business.³

Business models are ordinarily looked at as the “economic DNA of enterprises”.⁴ The best interaction of a company’s assets is determined to ensure the competitiveness of the business model. A company’s assets are usually compartmentalized according to physical, financial, customer, employees and suppliers. There has been a growing trend for companies to seriously take intangible assets into consideration when valuing the business and making decisions. More and more companies are beginning to realize that the value of their businesses rely much on their intangible assets, those assets that are not found in the financial records.

A typical company's business model will include the method of operation, location and operating area, target market and customers, competition analysis, ownership of the business, resources required, financial plans, marketing plans and metrics for measuring the company's performance. Usually, the business model will emphasize on the most effective way to reach customers and remain competitive. It is the company's manner of figuring out its competitive advantage and looking for ways to leverage on the synergies created in its organization.

In the last few years, companies are becoming more aware of the importance of placing technology and employee satisfaction as part of the business model and strategy. "Technology enables assets and business models to be scaled to encompass more than just a single product, physical location or customer."¹ Companies are not limited by reach or space anymore since technology made it possible for companies to operate across lands and seas. It has come to a point where companies can operate in different parts of the world and still stay within the flow of their operations. This has allowed companies to leverage on scale reaching a larger number of customers in the world. The technological trend seems to be directed towards making the world smaller as globalization become a common theme in companies' business models.

How different are the business plans for schools and universities from those of other businesses? The primary focus of universities is on its continuous commitment to provide education with quality at the forefront to its students. Businesses usually focus on the profitability of the company; they have to work towards making their numbers to achieve a higher return on shareholder's value.

A university's business model includes many factors in which the following are most important: (1) the students to attract; (2) the kind of faculty to maintain; (3) the programs and their curriculum; (4) the source of the course contents; (5) source of funds; and (6) infrastructure and resources required to run the university. This study will examine the processes and business models of various institutions. The institutions were chosen due to their distinct mission and vision, position in the industry and difference in tools and resources used to manage and run the institutions.

A. Massachusetts Institute of Technology (MIT)

MIT as a whole is directed towards excellence in research and education. It has always been a very entrepreneurial organization that allows faculty and students much freedom to explore their individual interests. As a faculty-led university, the decision-making process on major issues applies a top-down approach, issues and opinions have to be "sold" to faculty. The institution has a very bureaucratic structure, the decision process regarding proposals usually take some time before it goes through the whole decision-making loop.

The institution is satisfied with the current student population since the number is appropriate to the quality of education that it is committed to provide. With this in mind, MIT focuses its growth strategy towards other means that does not include increasing the number of students. It places more attention on the improvement of the physical space and campus environment to consistently sustain an atmosphere that is conducive for learning, interaction and development. It has never experienced much difficulty in attracting quality and talented students. The institution is committed in providing equal

access to students and eliminating any possibility of student discrimination. With no exception, MIT grants financial aids to all of its undergraduate students. As a result, only 50% of the actual tuition cost is collected from the students and aid sponsors. This practice ensures that talent is reached by MIT as it evaluates and accepts students using uniform and consistent criteria.

As a research university, MIT takes in Ph.D. students who receive regular stipends. The survival of a laboratory largely depends on the ability of the laboratory faculty to raise funds. MIT's Sloan School of Management though experiences a different set of dynamics from the rest of MIT. Sloan is managed the way a business unit is run where decisions regarding budget and resource allocation are done independently from MIT. Its budget pays for its own faculty and program costs in contrast to the rest of the university where additional funding can be received from the institution. Since Sloan School offers professional services instead of research, limited financial aid is available to students. Financial assistance from various financial institutions such as Citibank can be tapped by the students to assist payment of fees. Outright cash is collected from students as payment for tuition fees charged to enrollees. On the average, Sloan receives 90% of the tuition fees.

MIT administration is concerned with the high faculty turnover rate of the institution. The three most common reasons identified behind faculty's decision to leave MIT are: (1) academic life does not fit life goals; (2) better jobs found; and (3) incompatible with MIT culture. There is a clear move to reduce faculty turnover rate by placing more stringent recruiting procedures to raise the probability of accepting faculty who is clear on the vision and culture of MIT and adaptive to the changing

trends of society. To illustrate a point, Sloan School is currently trying to blend in Life Sciences with the management courses due to the growing importance of biotechnology in the community. The administration deems it necessary to encourage Sloan faculty to learn and know the current impact and trends in the Life Sciences sector which is also in line with MIT's vision to serve as a benchmark and leader in technology. This has become an important determinant to new faculty recruits in Sloan School. Another challenge that the administration faces with faculty management is balancing applied faculty with theoretical faculty in response to the growing need of the society and industry to gain more specific skills. Practical learning is now as important as conceptual learning.

MIT's commitment in leading innovations is evident in its university-wide shift in focus from one that was largely dominated by engineering to the field of science. Its investment spending has changed accordingly as reflected by its capital expenditures, new laboratories and research funding. With this shift in concentration, a shift in the kind of principal customers has been experienced as well where previously MIT largely catered to the needs of the Department of Defense and NASA but currently has received major funding from the National Institute of Health. Biotechnology has become the new buzz word in MIT and the surrounding community. These changes also came with institutional innovations exemplified by MIT's involvement in the Whitehead Institute of Health, Science and Technology. For the first time, MIT engaged in a joint faculty appointment program with the institute to promote sharing of resources. In the last few years, MIT has also established the Media Laboratory during

the technology hype of the late 90's. These examples are evidences of MIT's consistent commitment towards its involvement in societal demands.

MIT relies on endowments, gifts and sponsored researches for its sources of funds. As a non-profit university, MIT primarily focuses on what needs to be done and then on how funds can be sourced for the projects instead of primarily looking for projects that may be most financially profitable for the institution. The OpenCourseware Program and other similar MIT projects such as the distance programs for the MIT-Singapore Alliance and some engineering courses came about as a result of the initiative. To serve as evidence of its commitment to its mission and vision, MIT as an institution leader initiate programs that will benefit society domestically and globally. To keep true to its mission, MIT decided to share its courseware materials for free to the community as a contribution to the existing resources that are currently available for universities and institutions as these course materials serve as benchmarks to help them formulate and develop new courses as well as improve existing ones. In line with this goal, the administration is now strongly pushing the university to raise awareness of MIT's social impact through its research and education programs. Materials covered in classes and research must include relevant realities in current events experienced by the society.

Distance learning and other technological innovations will not impact the current educational system in the short-term. As of the moment, there is an urgent demand for MIT to focus on resolving challenges that it is currently experiencing. Further, changes in the industry and higher education environment will not easily affect the institution as

it has carried with it a reputable tradition of quality education using proven methodologies.

B. Harvard Extension School

Harvard Extension School was founded in 1909 as part of a vision of A. Lawrence Lowell's ancestor to give back to the community of Cambridge and Boston moral, intellectual and physical instruction and education. Its establishment was not as smooth sailing as they wished it to be as they struggle to ensure the prestige of the Harvard name. Agreement was formed that the name should not be diluted with the opening of the extension school. It was imperative then to staff the extension school with able officers, to develop a faculty that will boast of the same quality as that of the university and to accept students who show promise and strong potential for learning. As a division of the School of Arts and Sciences, HES was set up to satisfy the need of working adults and professionals who want to learn specific skills that they think they have a lack of.

Each year HES accepts approximately 14,000 students and offer hundreds of courses. There are currently 40 courses offered under the distance education program. Student profiles include working adults, young professionals, Harvard employees, commuters, foreign nationals on student visas, married students, parents, grandparents and retirees. Due to a very wide and diverse student body, classes have become more challenging to manage as the class needs to satisfy different points of view. Students come from all walks of life ranging from those who have earned a variety of degrees to those without any degree at all. The set-up of the school allows

students to transfer credits and complete unfinished degrees. New degrees can also be earned in HES along with graduate certificates.

Although no application process is facilitated to take classes in the extension school, degree students need to show the ability to maintain at least a grade of B in three required courses. This ensures the quality of the students that the school takes in. Previous record of transcript will not be used to gauge a student's potential to complete his studies. HES places a limit in the number of years allowed for the completion of degrees especially for courses that are technical in nature as they may be more prone to obsolescence. This has not specifically been a concern to the school since most students who register are fully committed to learning since the decision to study is fully their own.

Fifty five percent of the faculty members are composed of faculty from the Harvard School of Arts and Sciences while the remaining forty five percent comprises faculty from other universities and field practitioners. HES boasts to have the most distinguished set of faculty members. No struggle has been experienced in enticing teachers and professors to teach in HES. Some of them pursued the opportunity to earn more without placing excessive efforts in the course preparation process for courses they already teach in the college. HES also serves as a venue for professors to experiment with their new materials before further developing new and untested courses. Most of the faculty however teaches for the love of teaching a class composed of students with diverse experiences and thoughts. The quality of the faculty in HES is comparable to that of Harvard College and other Harvard schools. Luring in practitioners to teach has also proven to be a very effective option as practical

knowledge and application of theories and concepts taught are visualized and observable. Many of the practitioners have become very successful in their fields that they would want to give back what they have learned to society. The faculty makes it a point to include current environmental implications in their courses and programs. The curriculum and direction of course offerings are carefully evaluated as faculty decides on essential changes to current courses, addition of new programs and elimination of obsolete ones.

HES prides itself with its Foreign Language Institute that includes old languages such as Sanskrit, etc. Even though profitability in these classes is minimal, HES continues to offer these classes in fulfillment of one of their objectives to enable continuous awareness and understanding of our history and world. Its English as a Second Language program is widely participated and popular. Small classes are maintained to increase the level of interaction between students and professors. In this way, learning of the language is accelerated for both reading and writing aside from the conversational aspect.

HES is an independently ran institution where overhead is low and profits are high. It embarks on a model that reuses existing Harvard resources during its idle hours where Harvard classrooms are used by HES classes in the evenings. This arrangement exempts HES from accumulating maintenance costs, utility costs and other overheads that come with using and maintaining physical infrastructures. HES also exempts itself from providing faculty benefits and only spends on stipends for its faculty wherein the rate depends on the number of hours taught. Further, HES also does not run its own alumni association. Students who graduate from HES

automatically belong to the Harvard University Alumni Association. Other resources such as libraries are also maintained by the college and not by HES. Due to these arrangements, expenses are very low. Its major expenditure is the overhead cost incurred for the 120 member staff of HES. Its cost structure allows HES to offer the lowest tuition amongst the continuing education institutions. Profitability is so high that HES generates millions of dollars for Harvard college. HES has become less dependent on external sources of funds, lessening the pressure on the institution to seek contributions from alumni. In addition, financial aid is also available for degree students. HES really pays for itself and can therefore manage itself independently from the other schools.

Although HES already serves around 14,000 students annually, it recognizes the substantial number of potential students who would like to take courses but are not able to do so in an on-campus basis. This is the major driving force behind HES' distance education programs. Resources and investments for distance education have been increased as HES invests in one whole floor of a building just for the development of distance learning courses and programs. The motivation behind this program is to provide service and education to those who cannot possibly attend classes on-campus due to physical challenges and other reasons. As of the moment, the online student population has not been measured or targeted for the operability of the distance education courses as this program is not money-driven but more service-oriented. Careful management of the programs for distance education has been done to make sure that quality education is maintained even though courses are done online.

Classes that require a higher level of interaction are most probably not considered for distance education programs due to technical limitations.

HES considers a number of continuing education programs as its competitors. The list includes Boston University, Boston College, Brandeis University and Northeastern University. To continuously differentiate itself from its competitors and exceed expectations, HES positions itself in a manner that allows for timely adjustments in courses according to the current economic conditions and environment and the type of demand that exists among the community. HES engages in new services and programs with careful consideration of the implications of the changes. It makes sure that its decisions result in lasting applications and effect forward movement of the school as it is currently seen as a leader in quality education. Although changes in HES might be deemed as slow by other institutions, HES would rather move with confidence than engage in new programs that might later on prove to be a “fad”. Its commitment lies in providing education that is lasting and most relevant to the current societal environment.

C. University of Phoenix

The founder of University of Phoenix, Dr. John Sperling, recognized the potential in establishing a university focused primarily on serving the needs of working adults and founded one in 1976. Historical facts regarding the huge number of adults in their 30s from the generation of Baby Boomers and the increase use of technology demand a different kind of education offered in higher education institutions. Education for working adults in universities was not very much developed at that time.

Not much effort was placed for the improvement of working adult education where classes were solely held at night. University bookstores and offices were not open at night to serve the needs of working adults. Students had no choice but to sacrifice some of their day hours to register, enroll, buy books or seek for consultation from professors and advisors. This resulted to students spending a longer period of time to finish their programs, more than 8 years for a 4-year program and more than four years for a two-year program. As a result, University of Phoenix opted to develop their own program curriculum, teaching methods and student services that will specifically address the educational needs of working adults.

With their commitment to ensure the practicality of the programs they offer, the teaching method applied is driven towards a more application type of learning. University of Phoenix has proudly adapted its learning model wherein small classes with an average of 12 students are maintained to “preserve a highly interactive and personally relevant learning experience.” It recognizes an important distinction between young students without experience and working adults with practical knowledge. Older students with a high level of experience and insights have usually lesser time to devote to their education. What is the best way then to arm the adult with all the necessary lessons at a shorter amount of time? The environment for them must be one that fosters knowledge sharing and ability to apply their knowledge immediately in the real world. The learning model aims to train and educate its students in the following areas: (1) Professional competence and values; (2) Critical thinking and problem solving; (3) Communication verbal and written; (4) Information utilization for research and information gathering; (5) Collaboration in diverse groups;

and (6) Team learning that highly applies interactive learning, learning groups and teams.

What is most unique about UOP's education model is the mix of on-line and traditional learning in its system as exemplified by its FlexNet program. This program allows students to attain scheduling flexibility where they can take their classes on the web and face-to-face class meetings. Aside from the traditional on-campus programs and FlexNet, pure online students are also managed by UOP. For online education purposes, the online learning system also allows students to log on anytime for student services, interact with classmates and communicate with instructors. Digitized learning materials have also increasingly been supplied to and used by students. The university has placed a strong emphasis on adding new digitized materials with the goal of allowing students to read, analyze and work on lessons online. This effort is in line with the practical reality that work transactions are done through the desktop more and more each passing day.

University of Phoenix maintains faculty that are mostly practitioners who work in the field in which they teach and most of them had earned advanced degrees. This assures UOP of faculty that can maintain the "practice by learning" mission of the institution and can combine teaching both practical and theoretical concepts. Only 285 faculty members out of 17,000 are full-time, 4,000 faculty members are focused on online learning. A very tight set of criteria is maintained by the university for faculty members as faculty must have at least 16 years of experience in their fields, hold offices in professional and academic organizations, teach an average of six courses per year and most importantly teach out of professional and personal interest.

In addition, UOP is also a public institution and is therefore committed to bringing high returns for its shareholders. It prices its student fees at a premium enabling it to gain a competitive profit margin. As a market leader, it can afford to charge higher tuition. For the past three years, the UOP stock has consistently increased even as the tech stock market slowed as its student population also increased. Studies revealed that 13% of 500,000 US students earning a degree via the Web are enrolled at UOP Online. UOP is fully aware that market saturation is not going to happen very soon as there are still 70 million working adults in the country who do not have a college degree. At present, UOP online has started targeting the international market and has garnered around 500 students a month. In order to accommodate the non-English speaking nations, UOP also plans to begin offering degrees in Spanish and possibly Mandarin.

D. Brandeis University Continuing Education

Brandeis University is a private non-profit research university that has been operating since 1948 and is also the only non-sectarian Jewish-sponsored college or university in the US. It offers programs in the field of humanities, arts and social, natural and physical sciences. As a liberal arts college, Brandeis maintains an interdisciplinary approach in its learning process. Brandeis offers masters and doctoral degrees programs in 29 fields. It owns an International Business School that offers Master's degrees in business and administration. It has a separate entity which manages the summer and continuing studies and programs.

The Continuing Education division of Brandeis is only seven years old and solely provides degree programs. It does not offer short non-credit courses to potential students and so far only offers masteral programs in Software Engineering, Bioinformatics and Project Management. The strategy lies in targeting niche markets and providing programs that are not offered by any other university or college in Massachusetts or the US. Most of the continuing education students work in the offices along route 495, live in New Hampshire and the Cape. All of the courses are taught in a manner wherein application is the focus since it recognizes the usefulness of practical knowledge to students with considerable working experiences. It also explores the possibility of creating synergy between the programs where courses may be relevant and applicable to two or more programs offered. Genuine effort is placed in designing programs to be as flexible and as accessible as possible since Brandeis prioritizes the unique needs of students who are in their 30s and working full-time. The designs of the programs are worked out carefully so that the quality of education is maintained and not sacrificed. Students who are interested in the masteral programs offered by the Continuing Education School must have completed at least one bachelor degree. Each masteral program requires ten courses, 10 weeks per course, 3 hours per week. Students are most welcome to try out one or two courses before committing themselves fully to the program to give them a taste of the kind of education that they will be immersed in and to enable them to accurately assess the suitability of the course work and demands in their lives.

Another factor that Brandeis' Continuing studies emphasize on is their outcome or output approach to students' learning. Most renowned universities

implement a very tedious and competitive application process to ensure the selection of the most capable students. Once the students have been accepted however, little attention is given towards what they have actually taken away from the education. Brandeis CE places serious effort in making sure that students have gained “real” learning that can be specifically applied to their work and career aspirations. The application process is comparable to other universities except that GRE and other similar tests are not required. In this way, Brandeis CE will consistently provide attention to each and every student’s progress and learning experience.

At present, CE operates independently of the main university and its other schools however resources used by the CE programs are owned by the central administration. Each month, CE hands over a percentage of its income to the administration as a payment for overhead costs incurred for the use of classrooms, utilities and IT support systems. There is an intentional effort to keep the college of arts and sciences separate from the CE. The CE employs its own faculty that is largely made up of practitioners and working professionals in relevant fields. On the average, faculty receives a stipend that ranges \$4000 – 5000 per course. Due to the “newness” of the CE’s programs, none of the current faculty teaches courses that are applicable to the masters and doctoral programs offered by CE. There is also an existing prejudice that the programs offered by CE will never be as good as the day programs. Due to the newness of the programs, it will take some time to measure the real value of the CE courses.

Brandeis CE’s approach is also very different from the traditional approach. It is the first time for any school in Brandeis to venture into distance learning. The CE

personnel believe that distance education is an important initiative to date and will most likely play a significant role in future education. Five courses in the software engineering program have separate course versions for distance learning. Brandeis recognizes the challenge behind developing and teaching online courses that investment for training has been allocated to teach instructors on how to facilitate real-time distance learning programs. All the contents are developed and owned by the instructors. Aside from the content development, another difference between online and face-to-face classroom based learning lies in the participation of the students themselves. Distance learning relies on the student's initiative to participate and contribute ideas to the course. It may demand more time and effort on the part of the instructor and student since the learning orientation is different from classroom learning. The type of interaction between students and teachers can define the effectiveness of learning in the class. The technological infrastructure must be stable enough to support active participation online. This proves the point that distance learning is not really more cost-effective. It just increases the potential market that a university can target and allows a different type of interaction in the online class that is not possible in campus-based learning.

Brandeis CE sees a lot of potential in distance education as it looks on the more interactive and effective outcome in global corporate training and education programs where standards are learned, potential for international reach increases, the accessibility and flexibility requirements of working adults who will find the need to re-educate themselves several times are satisfied. The market for higher education will evolve and will require universities and higher education institutions to respond fast to

the changing needs. The responses to the changes in the higher education industry will be more easily managed by the continuous education division of colleges and universities where flexibility and responsiveness will not be as challenging as the established and traditional schools of the institutions.

E. UK Universities

In the past years, universities have been able to adapt to the changing demands of students as they introduce new ways of delivering knowledge and new types of courses. Part-time study is also expanding with 11% of first degree graduates obtaining their qualifications through part-time programs.⁵ The number of first-degree graduates has increased by 39% from 1995 to 2002. 11% of higher education students pursue further education in colleges that are near their homes or work. It is also important to note that in 2001, 21% of the students study from home compared to 15% in 1994.⁶

UK is now currently facing many challenges in the aspect of higher education learning. It is alarming to see that promotion for academics is based more on research excellence rather than teaching ability. There is no respected professional career track specifically for higher education teaching. Recruitment difficulties have also arisen in which 60% of institutions reported difficulty in recruiting lecturers. Another area that UK is going to focus on is streamlining the knowledge transfer process from HE institutions to businesses and industries. Currently, 16% of the companies are actively using information from higher education institutions and an increase in this activity has been observed in the past few years. In addition, UK is investing more effort in enticing individuals from low-income families to pursue higher

education. Many initiatives are in place to increase the accessibility of universities for those who cannot afford to pay for the upfront fees and other fees required to stay in school. There is a clear intent to tap more talents and gifted individuals that belong to low-income families and educate them in universities.

Due to the rising pace observed in social and technological changes, many believe that education cannot be confined to the early years of life. Lifelong learning is becoming the new education wave of the future. There is a need for students to return to learning at different segments of their lives in order to not only learn new skills and acquire new knowledge, but also to refresh past knowledge and sustain their employability. “Lifelong learning therefore implies a fundamental shift from the once-in-a-lifetime approach to higher education to one of educational progression linked to a process of continuous personal and professional development.”⁷ This might result to an increase in popularity of shorter, more work-focused courses. The challenge then is to eliminate the negative prejudice against vocational or short-course education and improve the employment opportunities available for people with skills attained from short courses. The trend also shows that more flexible programs and modes of learning are provided to students to enable them to make real choices with regards to their learning atmosphere in the more work-focused environment.

The UK government has launched an e-enablement project that also emphasized on improving higher education through its e-education project. The prime minister sees that it is imperative for UK to gain its competitive advantage in the international scene.¹ The e-education program focuses on two specific areas. One is motivated by an economic imperative in which the purpose of implementing

technology lies in enabling universities to gain management efficiency wherein it is ideal to build a common administration and IT infrastructure. The other area focuses on the pedagogic imperative where learning might be better achieved through the use of e-tools. The government has increased the budget for leading universities to approximately \$1 billion which is large by UK standards to professionalize the management of universities and eliminate waste.

The UK Open University has been in operation in the last 30 years. Distance education is one of the major instruments that UK will continue to push forward to reach potential students and working adults, to allow students the flexibility in the selection of courses, location and mode of learning. Distance education is currently more popularly used at the masteral level of UK universities and its application has increased although the industry still experiences a very strong demand for face-to-face learning in the classroom. An organization named UK E-Universities Worldwide Limited has been set up by the UK government to establish a standard platform that enables academics to prepare higher education courses in electronic format. It seems to appear that overtime academics will be able to figure out a better way to use e-learning in conjunction with the traditional approach to education.⁸ There has been strong evidence that students' learning might be better when they start off with e-learning and slowly shift towards face-to-face classroom learning. The medical students in Manchester University, for example, found it easier to learn anatomy (basic course) via computer-based learning technique.

Another driving factor for the improvement of the higher education accessibility is funding. The government has realized that the current incentives and

funding in place do not improve the accessibility of higher education institutions. The school fees are adjusted according to the income of the parents of students. The current fee arrangement requires at least \$1,125 of upfront fees to enable students to register in a university. Students who belong to low-income families however, cannot afford to spare even \$1,125 for education. To top this off, education history in low-income families does not include a bachelor's degree. Most of them begin working right after high school and do not find it necessary to acquire a bachelor's degree and this belief and practice are passed on from generation to generation. This has led the government to make the decision of eliminating upfront fees and allow students to study without paying for any fees during the course of their education. Students are expected to pay back the loan once they begin working. Their payments will be adjusted according to the income they receive to ensure that payments will not be a burden for the graduates in the future.

University funding will have to be raised to accommodate the decrease and elimination of fees. Additional funding from the government will compensate the proposed changes in the collection of upfront fees. Universities earn majority of their funding from the government and this arrangement limits the capacity for growth. External sources of revenue and funds are now looked at as a way for universities to gain additional funds and compete more efficiently. Only a few of the universities receive endowments namely Cambridge University and University of Oxford. The government is now encouraging and supporting programs to increase endowments in universities and explore other income streams that will come from industries. Universities form powerful and strategic relationships and links with businesses in the

industry, such as manufacturing, and receive payments for research or collaborative work.

The UK government has observed a current trend of consolidation among higher institutions although strong resistance towards this activity is still experienced. The increase in collaborative activities between universities should help the consolidation process in the future. Manchester University and Manchester Institute of Technology has combined as it finds more value in becoming one entity. Other universities are attempting to consolidate as well as attainment of considerable cost efficiency and improvements in major operations become more evident.

| SCHOOLS | FOCUS | STUDENTS | FACULTY | FUNDING | INFRASTRUCTURE & TECH. INVESTMENTS |
|--|--|--|---|---|--|
| MIT – non-profit private institution | Research & Education | 4,000+ Undergraduate 5,700 full-time Grad 350 part-time Grad | 966 full-time | Endowments, Rentals, Gifts, Research sponsors, Industrial sponsors, tuition | Major constructions, major expense in supplies & services, very strong technology investments |
| Harvard Extension – non-profit private institution | Continuing Education, foreign language institution, courses on skills training | 14,000 students | From Harvard College, working professionals and practitioners | Tuition fees (low) | Low infrastructure costs to almost none (recycle Harvard college resources), increasing investments for distance learning |
| Brandeis CE – non-profit private | Provide programs not provided by many institutions, niche markets, outcome approach | 3,051 Undergrad 1,346 Grad 3,100 Continuing Ed | All working professionals and practitioners for approx. 30 courses. | Funds come from Brandeis main administration according to the budget proposed by CE | Low infrastructure costs (provide percentage of income to main admin.), increased IT investment for distance learning |
| University of Phoenix – for-profit public company | “Practice by Learning”; cater to the needs of working adults, offer on-campus, online and Flexnet programs | 129,035 total 90,974 online | 260 full-time out of 17,000 total; others are practitioners in their fields | Market capitalization, shareholders, charge premium to tuition fees | Many campuses but minimal infrastructure costs, consolidation, high technological investments as this is the foundation of base strategy |
| UK Universities – 90 managed by privy council while 1 is private | Increase student population, adapt lifelong learning philosophy | 6,000 – 20,000 students per university | 600 full-time (approx.) 40 part-time (approx.) | Bulk of funds from UK gov’t., few endowments, some from student fees | Low infrastructure investment, go for consolidation instead, increased IT investments |

Table 5. Summary of Business Models

CHAPTER IV. Technological Initiatives

Information and communication technologies (ICT) enable the increasing popularity of distance education programs. ICT has enabled a leap in access to information that has changed the way we manage our businesses. Although its impact to education has been quite limited to electronic mail, digital imaging and online library services, many educational innovations have propped up to allow interactive learning online. Real life simulations of subjects in class significantly aid students' understanding and retention of lessons and facts through the "learning by doing" approach. Advances in ICT enabled new forms of access to information. Students can participate in drills and practice their skills and feedback can be immediate and personalized.

Aside from allowing access to more information, ICT has also enabled a more convenient and efficient way to access people. Networking has been made easier due to tools such as email, course management groupware and video conferencing. Live discussions and interactions with peers and colleagues are possible due to advances in ICTs. Technology has improved the facilitation and direction of researches through "collaboratories".⁹ These collaboratories allow researchers and scientists to report, give feedback, update and share developments of their research across the globe efficiently. Researchers in France can quickly access information regarding the progress of researches done in the USA. And when the ideas need to be shared, researchers can immediately tap into the system and record information needed.

It is also important to note that ICT has improved access to services where it has significantly changed the way universities are managed. The vast improvement in internet

technology has been the main driver in allowing universities to effectively extend their presence on the Web. Prospective students can now easily gather information regarding the universities that they are interested in. The internet has enabled faculty to market themselves and their courses on the Web. Students' reaction to websites can influence their decisions regarding the universities that they would want to apply to. The university's website really serves as the university's face to the community. Aside from the mentioned uses, technology has allowed universities to experiment with different forms of learning. This has truly expanded the target market of universities as they move forward catering the needs of students from diverse backgrounds and physical locations.

A. National Science Foundation

The National Science Foundation is an investment agent that supports integrated research and education in universities and colleges for the next generation of scientists and engineers. Similar to the already mentioned initiatives, NSF envisions a new cyber infrastructure. NSF supports initiatives that promote advanced computing resources, digital libraries, shared data and information bases, research and education networks, distributed user facilities and standards and protocols. It also looks forward to new capabilities on a tera-scale and nano-scale mode of measurements. NSF aims to ensure that all people in the population will be given the opportunity to succeed in science and technology as a significant portion of the Nation's pursuit of global leadership. It also recognizes the importance of fostering an environment that provides the opportunity for all students to advance to higher levels where the process of learning does not end in the classroom.

Over the years, NSF has adapted to the changing national priorities. While it has increased its support for fundamental research, it has also assumed greater concern with regards to technology and transfer of knowledge to industry. Increasing support for intellectual integration to bring the knowledge and skills from different disciplines to bear on complex problems is apparent. “Collaboration across traditional disciplinary boundaries is a positively reinforcing process: the first interdisciplinary discoveries lead to the discovery of many new problems at the disciplinary interface.”¹⁰ It is important to cite the various technological initiatives that are led by government institutions and other major organizations and research laboratories. These initiatives, if successful, will significantly affect the direction of distance learning since they directly influence the technology surrounding the dynamics of distance education.

B. Next Generation Internet (NGi)

Another huge project commonly known as Next Generation Internet (NGi) pertains to the future network and the work underway to develop it. “This Internet will be so pervasive, reliable and transparent that we’ll all just take it for granted. It will be a seamless part of life --- like electricity or plumbing.”¹¹ The principal agencies involved in this initiative are the National Science Foundation, the Defense Advanced Research Projects Agency, the Department of Energy, NASA and the National Institutes of Health. They aim to connect universities and national laboratories with high-speed networks that are 100-1000 times faster than today’s Internet. The goal is to connect at least 100 universities and laboratories at faster speeds that enable it to transmit the contents of the entire Encyclopedia Britannica in under a second. Other objectives of NGi include the promotion of experimentation with the next generation of networking technologies that

may result to a dramatic increase in the capabilities of the Internet to handle real-time services such as high quality video-conferencing. There is also a genuine effort to enable new applications that meet important national goals and missions: higher speed and more advanced networks will enable new applications to support scientific research, national security, distance education, environmental monitoring and health care.

One of the significant applications of NGI is on distance education as universities are currently experimenting with technologies such as two-way video to remote sites, VCR-like replay of past classes, modeling and simulation, collaborative environments and online access to instructional software.

C. University Corporation for Advanced Internet Development (UCAID)

The University Corporation for Advanced Internet Development has a program called Internet2. This consortium is led by 206 universities in partnership with industry and government to develop and deploy advanced networking applications and technologies to create tomorrow's Internet. The major goals of this consortium are to create a leading edge network capability for the national research community, enable revolutionary Internet applications and ensure the rapid transfer of new network services and applications to the broader Internet community. Internet2 also seeks to establish global ties to ensure global interoperability of advanced networking. There is a conscious effort to enable collaboration between U.S. researchers, faculty, students and their overseas counterparts. Peer-level relationships are established between organizations in and outside of the US. Many achievements have been realized in the joint technological projects pursued by universities such as MIT, North Carolina University, University College London and University of

Oxford. Examples of projects include Collaborative Tele-immersive environments to study behavioral effects and implications of virtual environments, the creation of VIDOS which is a WWW based video editing and customization service for the UK and US academic community and others.

D. Center for Advanced Educational Services (CAES)

The Center for Advanced Educational Services (CAES) is an organization in MIT that focuses on research, development and delivery of technology-facilitated education. A handful of end products have resulted in the research and experiments conducted by CAES. In order to successfully test and implement the products, the Center works very closely with the different MIT Schools and Departments. Most of the distances learning credit courses offered by the schools are geared towards professionals and lifelong learners. Many of the products that CAES have developed include asynchronous teaching and learning through on-line web tutors, videotapes, videostreaming, and CDs. Collaborative learning is strongly encouraged by the technologies developed where interactivity and feedback are facilitated.

As the world becomes smaller and reach has become extended across nations, CAES has committed itself to focus more on connecting to the community beyond the MIT campus. One of its most notable accomplishments is the MIT World, MIT's free, open video streaming web site that shows the significant public events held at MIT. This allows the global community to participate and witness the intellectual content in MIT. Other projects include education in developing online programs for distance education, partnerships with various universities in located Africa and Singapore.

The CAES' future plans include continued emphasis on research and development in technology enabled education. Stronger support for the new initiative entitled Learning International Network Consortium (LINC) will be offered to provide tools for developing countries to empower the educators to create tertiary education programs and projects using the technology-enabled distance learning. More strategic relationships will be sought out and formed to enhance the research and development initiatives of CAES.

E. Wave Division Multiplexing

Wave Division Multiplexing (WDM) divides the light traveling through fiber into wavelengths, also known as lambdas. Each wavelength can support the high speeds that once required entire optical fibers up to even 10Gbits/sec/ WDM allows the transmission of multiple channels over a single fiber as data is sent over different wavelengths. At present, WDM allows the transmission of multiple channels over a single line as data is sent over different wavelengths. At present, WDM can carry as many as two dozens channels but they are eyeing a capacity of 128 channels or more on a single fiber in the future. A system with 24 channels can achieve a capacity of 60Gbits/sec while a 40 channel can support a capacity of 100Gbits/sec. Another technology named Dense Wave Division Multiplexity (DWDM) has subsumed WDM. DWDM is most useful for point-to-point links over great distances. Providers and users would be attracted to the DWDM technology since the cost benefits are very obvious. Less equipment is required by DWDM and the focus will be in optimizing the fiber already in place to support a larger capacity for data transmission. Fiber optic cabling moves a huge amount of internet or web traffic quickly but these pipes will eventually feel a bandwidth overload that new fiber cabling

will have to be laid to accommodate more traffic. As we know, fiber optic cabling costs an exorbitant amount of money that this solution will prove to be anti-optimal. Instead of doing that, providers now rely on technologies that increase the amount of data a single piece of fiber can handle.

CHAPTER V. Distance Learning

Distance education has been a learning model conceptualized by many theorists since the early 1900s. Traditional learning usually focuses on the teacher giving lectures to a class of at least 50 students where the pace of learning is driven by the average capability of the class. It is essential to take note of the fact that distance education applies the model where the learner is central to the teaching to understand why it is different from other forms of education.¹² A theorist by the name of Holmberg suggests “that real learning is primarily an individual activity and is attained only through an internalizing process.”

A significant paradigm shift is necessary for students and teachers who embark on distance education. A “transactional distance” is experienced between teachers and students and this distance does not only pertain to geographic distance but also educational and psychological distance. More will also be expected from the student as he takes on more responsibility freeing the teacher from any “custodial” duties of teaching. Students who want independence in learning will be most attracted to distance education as they control their pace and time to learn anytime anywhere.

A. Distance Teaching Systems

At present, we see two types of distance teaching systems: autonomous institutions and mixed institutions. Autonomous institutions are free-standing organizations, such as private and public correspondence schools and distance teaching universities. Mixed institutions are usually independent study divisions of extension colleges, consultation systems and integrated systems. Consultation systems assigns students to consulting

institutions that provide the instructional services while students receive the degree from distant universities or colleges. Integrated systems offer the same course on-campus and via distance education. More and more universities engage in distance education primarily in their continuing education divisions as they target working adults and satisfy their needs of learning and educational flexibility. We see distance learning applications in Harvard Extension School, Brandeis University and University of Phoenix. MIT holds some distance education classes as part of their collaboration and alliance with some universities in China and Singapore.

Even though the concept of distance education is ancient, the complexity of adopting it as an effective form of education increased due to technological advances, global social and economic developments, industrial and post industrial organizational structures and some media attributes. The most challenging factor though is the fact that each learner owns various kinds of traits and reacts to the presentation of materials differently. There is the challenge to address individual differences in perception, information processing, cognition, motor behavior, and affective states. An increasing variety of digital media has emerged to try to establish a learning system that may satisfy majority of the individual preferences. Another important driver in distance learning is the development of an effective distance learning community that contributes very largely to the effectiveness of a learning program. Increased participation is expected from learners as minimal participation in discussion groups is required. This implies that the rules and policies in classroom learning cannot be totally applied to a distance learning program. Different policies may be set-up in distance learning to motivate students and to provide the appropriate amount of interaction and participation. Many subsystems are actually

interacting with each other vigorously. Figure 8 illustrates the set of nested and hierarchical subsystems in the distance education realm. Each subsystem affects all others no matter at what level.

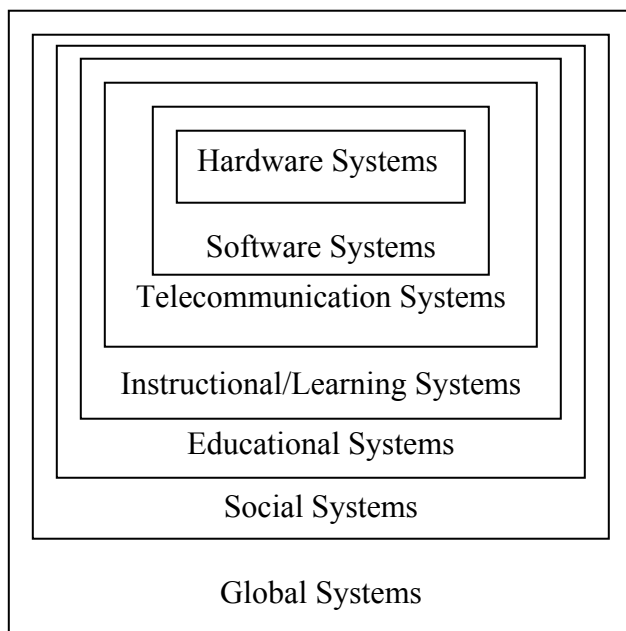


Figure 8. The hierarchy of interacting subsystems that affect distance education.
Source: Handbook of Distance Education

Post industrial organizational structures stray away from the concept of employees doing routine jobs on the factory floor. More emphasis is now placed on the individual's development as the industry moved to the knowledge-based era. In the US, a more pragmatic approach to distance education has come about as globalization and technological innovations are more extensively experienced by the American people. "The goal is to fuel the post industrial culture, the survival of which depends on innovation, not uniformity."¹³

Distance learning is an obvious result of the technological advancements experienced in communication. Most of the distance education course enrollments were in public 2-year and public 4-year institutions. The greatest number of enrollments in distance education is in the public 2-year institutions equivalent to 1,472,000 out of 3,077,000 or 48% of total distance education population. Among all the 2-year and 4-year institutions, 19 percent offer full distance education certificate or degree programs. Institutions were more likely to offer distance education degree programs rather than certificate programs. Among the institutions that offer distance education courses in 2000-2001, 30 percent offer degree programs while 16 percent offer certificate programs. Studies have shown that public 4-year institutions are most likely to offer degree programs designed to be completed fully through distance education, followed by private 4-year institutions and public 2-year institutions. Public 4-year institutions will most likely offer certificate programs while public 2-year and private 4-year institutions will not be more inclined to do so.

Many students prefer distance learning over classroom learning due to the convenience as its reach is extended. This is appealing to working students who may need to take care of their homes and families and continue earning a living. It is important for them to keep flexible schedules so as not to disrupt their daily routines while they continue to study and learn. Furthermore, forty-five percent of the institutions that offer distance education programs have received requests from the community to provide accommodations in distance education degree programs for students with disabilities.

B. Cost-Effective Analysis

Many have attempted to formulate a cost model for distance education. Due to the fast-paced changes in technology and higher education industry, models tend to become obsolete or inaccurate after a short period of time. Cost models also assume that the cost drivers of distance education remain static; however the opposite is true.¹⁴ The cost drivers vary according to the choices that institutions make. These changes were manifested in the four generations of distance education systems: (1) correspondence system; (2) educational broadcasting systems; (3) multimedia distance education systems; and (4) online distance education systems.

To delve deeper into the complexity of measuring cost drivers in distance education, it would be useful to expound on them. The first obvious cost driver is the choice of technology. It is true that face-to-face learning using the traditional approach involves very low fixed costs however a rapid increase in costs occurs as student population increases. An increase in the number of students must be complemented by an increase in staff members and infrastructure. Distance education can be more cost-efficient for large student population however a face-to-face online system will prove to be more expensive. The technology used in distance education will most probably be a one-time huge investment but the variable cost per student will decrease as the number of students increase. This reasoning is based on the assumption that the initial system's capacity can accommodate a large number of users without putting in additional components. Many caveats exist regarding the cost of technology in distance education since the technology choice does not depend on the hardware and software systems but on the working practices underpinning the use of technology.

Another consideration that higher education institutions need to make is regarding the use of existing course materials. It might be a good idea to transform these materials into distance courses with just a little commodification. With little effort, course materials may be adapted to distance learning courses at a low cost. Universities have to be careful with this assessment though since it is only applicable to courses that require little interaction among students and teachers in the class. Nursing and medical training and other basic courses are some examples.

As institutions move towards improving work practices, the technology may be used by management to reduce costs and drive changes in the organizational structure. Normally, the overall tasks of teaching may be classified into different roles --- curriculum design, instructional design, content preparation, materials development and production, tutorial backup, continuous assessment and examination script making. Distance education allows one to multi-task as the technology becomes more sophisticated. Content preparation and materials development may be combined and created at the same time. One of the huge and time-consuming tasks of institutions is the maintenance of the curriculum. It takes a lot of time to make, remake, change, update and maintain course curriculum. The higher the number of courses, the more expensive it becomes to develop and maintain the curriculum. This task is further challenged when students are allowed to take electives.

Reduction of costs may occur as other options are opened up to contract academic support labor. The institution can formulate short term contracts, outsource preparation of course materials and do tutorial work or a mixed of both traditional and online education.

A mixed mode institution may incur lower costs per student than distance education institutions since course materials can be reused for online courses.

The number of students in a course contributes significantly to the choice of medium of instruction. The effectiveness of the teaching mode applied in small and large classes varies. It has always been assumed that implementing distance education systems take advantage of the economies of scale. We have to take note though that the nature of the average cost curve is that the more students there are in the system, the harder it becomes to achieve significant economies of scale. “The pursuit of expansion in itself may cause costs to rise.” A balance on the number of courses offered and the number of students must be reached so that the average population per course will not be sacrificed and result to a lower cost of competitiveness of the courses. It is very tempting for institutions to offer many of their courses online especially when technology makes it very easy to transform course materials for distance learning. When distance education courses are not managed properly, poor attendance in some courses can occur and force institutions to cancel or drop the classes when the minimum number of students is not reached.

How cost-effective is distance education really? Many institutions prematurely conclude that the cost of running distance learning programs is low. They tend to miss considering the huge initial costs necessary to establish and develop the infrastructure, courseware and other materials required for the course. The speed of connections between users and the university must also be considered. In the United Kingdom and the United States, broadband is still considered pricey. On top of the time that is required to prepare for online courses, institutions apply very little incentives for faculty to do so.

As I have already mentioned, many factors drive the costs of distance education. To name the primary factors, they are the number of courses offered, frequency of course revision, type of media used, type and amount of student support and attrition rate. The cost effectiveness of distance education increases as the number of student increases and the number of courses decline. The goal is to grant the students access to quality programs and resources. This clarifies the definition of cost-effectiveness as it lies on costs in relation to education value rather than on costs alone. Distance learning is supposed to widen the student's ability to interact with other students and instructors that are not accessible in classroom or campus-based courses. A wider access to a variety of multimedia resources and experts worldwide is a valuable and distinct result of distance education as it improves the quality of students' learning experience. Another type of value is also gained by the learners in distance education. Related research and case studies show evidence of learners gaining capabilities in managing self-directed learning and sharing information to others in a cooperative and collaborative manner. As our world experiences exchange of ideas across regions and nations, collaboration has become more important for the continuous occurrence of globalization.

It is important to understand that measuring cost-effectiveness of distance education encompasses the values gained by learners, return on investment, optimal use of resources and improved performance of institutions as an organization to provide quality education in relation to the current environment and demands. Various approaches can be employed in measuring cost effectiveness: (1) value-based, according to the goals and vision of the institutions; (2) mathematical, considers quantifiable costs and benefits; (3) comparative, the use of different technologies for course delivery; (4) return on

investments, economic value to benefits and monetary gains; and (5) integrated, includes all factors in the previous approaches.¹⁵

C. Unresolved Distance Learning Issues

Distance learning still needs to overcome some important issues ranging from technological problems (infrastructure, network and speed), language use, ambiguous instructions to dealing with student distress. Other issues surrounding the legalities of virtual transparency might violate the privileges held by teacher-student relationships. Due to these issues, there is a growing fear that distance learning might “erode the intellectual and academic climate of the university” and destroy the quality of teaching. The major factors that keep institutions from offering or expanding their distance education program includes the high program development costs, lack of fit with the institution’s mission, concerns about course quality, limited technological infrastructure to support distance education and lack of perceived need. Many strongly feel that the web will not significantly affect and change the current educational system in higher education.

One of the challenges that distance learning faces is its ability to trace data for each individual learner that should include his or her prior knowledge, achievement of learning objectives and construction of new knowledge. Distance learning must have the capability to detect the needs of the learner, adjust to his or her pace and provide the appropriate method of learning to make his or her education most effective and beneficial. The achievement of these factors will increase the acceptability of distance education since these benefits are already experienced in face-to-face, campus-based, traditional education.

Research has shown that no significant difference seems to come out between traditional and distance education.¹⁶ The data for the research have come from hundreds of comparative studies, however emerging properties such as constructive learning were not considered in the research. Significant learning differences are usually manifested in this sense. It has also been challenging to measure distance education capabilities since it is not enough to analyze solely the student-teacher interaction. Other interactions are as significant in measuring the effectiveness of distance education such as student-student, teacher-teacher, student-content and teacher-content. It is difficult to pinpoint which interaction or how much of each interaction is necessary for effective instruction.

Distance education covers a lot of factors that contribute to its complexity. It may not be advisable to compare distance education with traditional education since selecting a form of education really is not an either-or option. Distance education is another form of education that does not seek to replace campus-based education. On the contrary, distance education is seen as an additional option for institutions to consider as they decide on ways to convey learning and information more effectively. Distance education has its benefits as more and more technological options provide the possibilities that would otherwise be not available because of costs and time or location constraints. Traditional institutions must seize the opportunity to use online technologies to increase the flexibility and openness of their programs as they make themselves more accessible to more students. In the UK and US, the nation has placed much emphasis and effort in providing education to all of its citizens. At present, the difficulty of reaching people in the lower class has proven to be a challenge. Distance education might be an effective means for adults and their predecessors to continue their education and earn degrees. More research and development

efforts have been placed on distance education technologies in response to the challenge of creating an atmosphere of “social presence,” the degrees to which a person is perceived as a real person, in the media-mediated learning environment, a strong factor for a learner’s satisfaction and motivation to continue learning.¹⁷

CHAPTER VI. Base Case Scenario

An assessment of the significant changes that are occurring in the higher education industry complements the observations regarding current problems in the educational system such as lack of classrooms, impersonal relationships with faculty, education that seems to be mass-produced, lack of emphasis on practice application, too much theory, and weak curricula. Employers are now looking for graduates with more practical skills and who can easily adapt to the professional environment required in the workplace. The government and society demand that institutions continuously explore various modes of learning and adapt to current demands and needs.

A. Current Industry Scenario

The change in employee or labor demand together with the rise of internet and technology advances created operational segments in the industry: (1) education v. training (comprehensive universities v. polyversities); (2) degree v. non-degree programs (general education v. specific vocational preparation); (3) full-time v. part-time students and; (4) on-campus v. distance learning courses. These changes signify the different challenges that may come about due to the evolving scene of the industry. Many established institutions were not able to foresee the changes that might take place in the higher education industry as they work very closely with their past and current students. The newer institutions foresaw the emergence of a different market that is as strong as traditional students.

Barriers to entry are lower with the birth of the Internet which allowed extensive communication, learning, teaching and sharing of resources across borders. New institutions can be built without having to invest heavily on physical structures. Although the technology has not enabled distance learning to fully replicate classroom learning yet, many courses have been actually taught as effectively over the internet. These courses are comprised mostly of short courses and introductory programs taught over the internet at marginal costs. Certificates on short courses have also become more popular among employees. The values of short-course programs may stand out as the popularity of this type of program escalates creating a belief that a series of short courses might be better than a 4-year college degree. Further, students who graduated from virtual universities have been successful in acquiring jobs thereby increasing the popularity votes of the schools they were in.

The availability of substitutes in higher education in the past was limited, however the changing demands of society has changed this scene altogether as we witness an increase in the number and types of substitutes available. One of the major changes is seen in current employers' preference to hire applicants that have specific skills outside of manufacturing and satisfy very specific requirements. This phenomenon was indirectly caused by the advancements of technology. Information systems, machines and equipment were built with advanced intelligence that enabled these facilities to perform tasks that used to be manually performed. Companies also developed in-house training programs that permitted them to provide their employees with the necessary skills for the accomplishment of tasks assigned in a timely manner. Corporations have also begun to

realize that in-house training cuts their costs and can contribute to the company's revenues once they offer these programs outside the company.

The types and number of complements have remained constant in the past years although the value that the industry provides to them is decreasing. An example of this would be the personal computer industry where a rise in demand was experienced in the early stage of internet recognition but has slowed down in recent years. This has resulted to the decreasing value of higher education industry to complementors.

One of the major changes that we are experiencing is the increasing power of faculty (suppliers) in higher education.¹⁸ Faculty has continued to be a very significant factor in the attractiveness of a university. The faculty plays a primary role in the design of effective programs that attract more students to the schools. With the current university structure, the faculty remains central in the execution of the courses that they have developed. Their research, knowledge and expertise are necessary to the education of the students as students expect to receive a large amount of information and gain insights from the faculty's experiences. It will be very difficult to substitute a popular professor with another without diminishing the value and attractiveness of the course.

The power of faculty has also increased as multimedia instruments are made available. Professors can freely distribute and sell their works to other entities and at the same time continue to teach courses in the universities that hired them. Faculty has also proven to be more enterprising as they involve themselves in independent businesses and entities. Since the quality of the faculty reflects the quality of universities, "star" professors have actually gained power over universities. Universities now continue to raise incentives and salaries of some faculty who have gained excellent research productivity and visibility

while other universities engage in competitive bidding for “famous” faculty. This situation, however, also resulted to universities’ preference to hire part-time faculty who are only compensated for their teaching time.

In the past, universities have been looked at as special organizations that are unlike business organizations. Profitability was not a primary concern, higher learning was. As the educational market changed with student clientele expanding and more universities propping up, tougher competition has altered the way universities are managed. The power of buyers (students) has immensely increased. There has been an increase in the demand for higher education since the 1990s which is in line with the increased financial support provided for students. Students come from more diversified backgrounds and are more selective.

As citizens look at education with increasing importance, as a way to improve their job opportunities and gain employability, the market has welcomed new players and instruments to accommodate the increasing demands. Students have learned to manage their “educational portfolio” since they are able to analyze more meticulously the pros and cons of attending specific universities and decide on the program that may grant them the highest value. The priorities of higher education are constantly evolving according to current trends as we observe increases in the:

- proportion of students enrolled in vocational subjects
- number of students in courses other than first degree
- number of students engaged in distance learning

- number of students from social groups that had not previously participated significantly (young people from disadvantaged home backgrounds and ethnic minority groups)

There is an increase in rivalry as government regulations are changed to allow more competitors to come in. The government is pushing universities to be more enterprising so that contracts from other sources, especially from private sectors, can increase funds and lessen the universities' reliance on public funding. A more important threat to universities is the increasing efficiency in distance learning. Institutions might be forced to expand the number of student population to gain economy of scale. Physical infrastructures may limit this type of expansion. Distance learning does not apply any student population boundary. Moreover, as institutions extend their geographic locations, overlaps between institutions may be experienced. On the social side, enrollments might decrease after the baby boom graduates and result to overcapacity in universities. This will likely intensify competition.

B. Disruptive Technology

Christensen's Innovator's Dilemma cautions companies of the emergence of disruptive technologies. S-curves are useful tools for illustrating a company's technology position in terms of a performance measure from early phase to maturity phase (Figure 9). New technologies are defined by a different S-curve when the performance measure of the new technology is not equivalent to the old technology. This new curve defines a disruptive technology. "Disruptive technologies are not obvious and expected in the beginning. Once the technology gets to a point that its performance can satisfy demands

from another value network, the disruptive technology can then invade it at a very rapid speed, defeating and pushing aside the established technology.”¹⁹

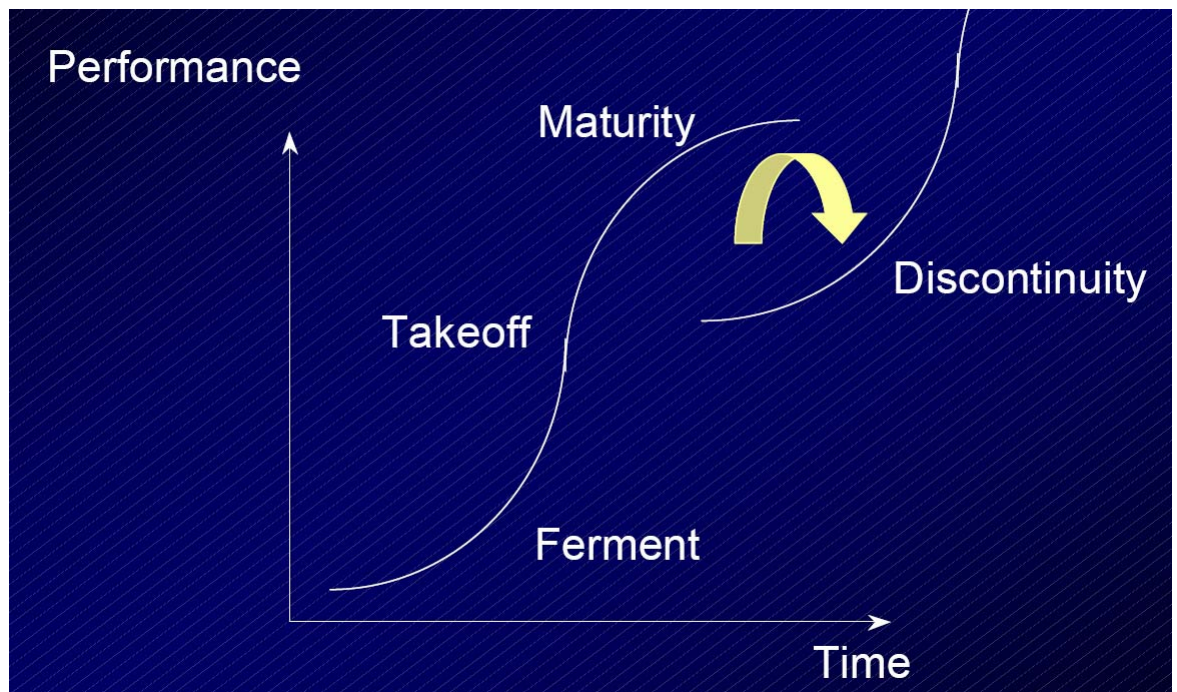


Figure 9. S-curve Source: The Innovator's Dilemma

Established universities and institutions (those with a hundred years or more of history) lie on the top of the S-curve at the maturity phase with Depth of Student Learning as a measure of performance. The brand equity of these institutions has been built on many traditions that have been born and kept by these universities. Historical achievements have also largely contributed to the high status achieved by these universities. Currently, we experience incremental improvements in these universities as they focus their efforts in maintaining their names and brands. These incremental improvements however entailed huge investments in terms of cash and time and cannot be easily disposed of. The new S-curve in higher education institutions might have Employability as a measure of

performance instead of Depth of Learning. In this case, students are now more concerned about increasing their level of employability at the shortest possible time.

The critical role that value networks play in the strategy of established companies decreases the ability of companies to detect and build disruptive technologies. The value network is characterized by specific rank-ordering of product attributes valued by customers.²⁰ The network also implies that firms shape their cost structure according to how they may best provide the valued products and services. Successful firms consistently fulfill their commitments to their customers and as a result produce their good and services in a more efficient manner. It results to improvements in development strategy lowering costs and development of new features and add-ins. This means that organizations are usually shaped by the need to allow the production of the best product. Higher budget is usually allocated for the development of “hit” products and services. Too much focus on customer’s immediate needs and increasing value of the product result to a firm’s inability to anticipate new technologies developed by smaller firms²¹ (Figure 10). The switching time usually takes longer for established firms especially for those with entire company structures formed to solely accommodate the valued products and services. Similar characteristics and practices are found in traditional universities and colleges.

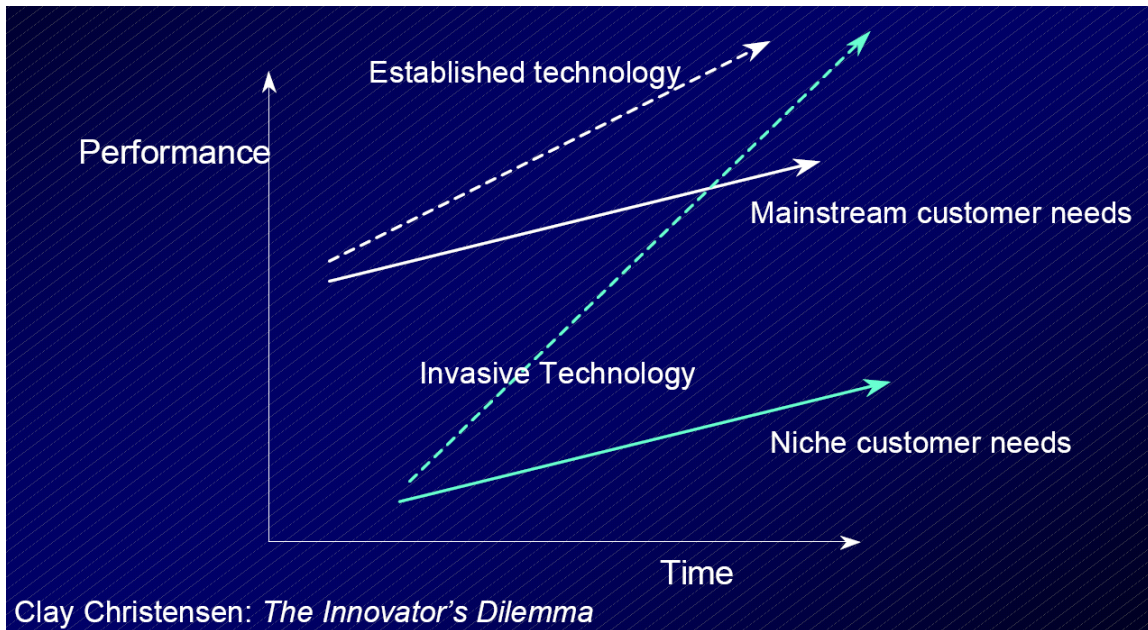


Figure 10. Disruptive Technology

Source: The Innovator's Dilemma

It would be useful to present the assumptions in university resource allocation to understand why universities are managed the way they are managed. The first assumption pertains to the “property rights” of an operating unit. Approved programs are assumed to continue unless some unexpected circumstances dramatically change the university’s priorities. Secondly, universities are expected to resort to other options in times of short-term financial fluctuations, such as budget deficits or revenue shortfalls, before reducing or taking out budgets for running programs. Thirdly, people often perceive a reduction of financial resources with a reduction in the quality of education. It is difficult for universities to embrace the thought on doing more with less.²² The organization structure found in higher education has been stable for years. The organization members are all familiar with the positions and roles established in the university that any major change will highly disrupt its operations and experience considerable resistance.

Due to the heightened competition in the higher education industry, traditional higher education institutions' emphasis on the importance of student (as customers) feedback can be likened to business firms' commitment to their customers. Rankings of schools produced annually by various media groups and organizations show how institutions fare in comparison to the rest in the industry. Students rely on these rankings in their selection process. The criteria used represent the products and services that students value in their educational environment. In the same way, rankings have also influenced the priorities of higher education institutions as they commit to provide the best valued products and services to their students. Each year institutions strive to implement noticeable improvements in their learning environment such as new buildings, new housing amenities, change in curricula, etc. Traditional institutions are risk-averse and tend to implement incremental improvements; no radical change should be expected from them from year to year.

Firms cannot solely rely on their customers for ideas of innovation. Customers may be limited and biased towards the current features of the products. As long as the existing product is used as the basis for improvements, a disruptive technology is impossible to detect.²³ In addition, it is very difficult for established firms to project the emergence or potential of a disruptive technology since market demand is difficult and sometimes impossible to foresee that the technology seems to be bound for failure.²⁴ The technology seems to bring the customers further from their customers' needs.

The "non-traditional" universities have foreseen a different higher education market that was unthinkable in the past. There is a market composed of people who would like to get an education but do not place any importance at all on socialization and research.

They value near-term education where the value of education is easily quantifiable. The cost structure of these universities are very different where educational space is leased and not owned making it easy for them to establish universities in different locations. Faculty effectiveness is evaluated using only one dimension --- teaching effectiveness. “As Western society is becoming knowledge-based, so industry and commerce are demanding a higher level of education from their new recruits, and demanding a greater number of recruits who have that level of education.”²⁵ This paved the way for mass higher education that totally changed the traditional university ethos. No increase in funding was experienced with the growing demands and as a consequence, the same set of faculty and university staff was loaded with more work. More students demand to improve their specialized skills through university education and more are returning to universities after some work experience. This type of demand paved the way for the birth of masteral and postgraduate programs accommodating the need for continuing education. The challenge of securing a strong and stable graduate program comes in designing a curriculum that satisfies the “integral and pragmatic” learning as demanded by people coming from different backgrounds and professions.

An important change also occurred in higher education. Part-time programs are now offered to those who choose to continue working or living in a different geographic setting. It took some time for traditional universities to cope with this new demand that modified the working model of universities in terms of the work hours and way of teaching. In 1987 for example, almost 39 percent of the students in the UK were part-time and the number has increased since then. The same scenario is observed in the US.

Face-to-face learning in the traditional approach is still preferred by many universities and institutions. They continue to believe that this approach is the best and most effective for learning. New modes of teaching are usually not explored by these large institutions. It will also be difficult for some institutions to radically shift to another mode of learning when their primary differentiator is their way of teaching. Harvard Business School's Case Method is one good example. New entrants to the market are more likely to explore new modes of learning and target another type of market to avoid competing with established institutions directly.

Open and virtual universities “appear to be on the first steps of a path in the business world that is described by Christensen as a disruptive technology.”²⁶ These institutions have identified a set of customers who were over-served by the existing traditional institutions. The customers pertain to working adults who do not look at the socialization and research aspects of higher education as integral for learning. They would much rather prefer to be in a learning environment that is student-centric and focused on job-related education. The Open University of England is experiencing success with over 200,000 enrollments in 2001 of students from all over the world. It provides multimedia materials that are centrally-prepared to students asynchronously. Interaction sessions are provided for students for more important discussions of issues and questions. The Open University has been ranked 10th among 77 other higher education institutions in terms of quality of educations in 1998. A United States Open University has also been established but is initially focusing on the executive education market. It will gradually expand its programs and clientele, making it an alternative approach for higher education.

Distance learning takes out the geographic and space constraints, expanding on student convenience. Although the current presence of distance learning is limited within the secondary markets, its continuous improvement will most likely allow it to penetrate the market of traditional higher education institutions. The success of online universities is evidenced by the annual growth of enrollments by 10 to 20 percent per year. University of Phoenix has the largest number of enrollments per year and grants 4 percent of the MBA degrees in the US per year. The student population and the number of graduates have consistently been growing annually. Together with the mentioned growth, the quality of the learning approach in these universities has continuously improved over time. There is no doubt that these institutions will encroach on the market of traditional universities. The graduates of University of Phoenix Online have reported success in landing quality jobs right after earning the degree. Online universities have also eliminated physical infrastructure investments and turn these funds towards the improvement of technologies for teaching and learning. Many institutions have also opted to “recycle” existing infrastructures by holding classes during idle hours. Furthermore, online universities will continue to challenge the high costs of research and traditional universities that will lead to serious questioning by potential students regarding their education options. Although distance learning has not yet achieve the quality that we experience in face-to-face learning, we have continued to witness positive leaps in the technology. More and more professors and teachers have also begun to experiment with the existing educational technologies and explore various types of learning modes.

There are five major principles²⁷ that managers in successful firms should be aware of:

1. Resource dependence: Customers (students and faculty) indirectly control the resource allocation strategy in established companies.
2. Large companies (established universities) are always looking for big markets that satisfy their growth needs.
3. Firms must be willing to invest in technologies where its ultimate function is not known in advance.
4. Firms must keep in mind that an organization's capabilities are distinct from the capabilities of the people within that organization. The attributes of a disruptive technology must be shaped and looked at from a point of view that might be contrary to the established technology in extreme cases.
5. Technology supply may not equal market demand. Successful firms were able to develop new markets that valued the attributes of the disruptive products. We have to keep in mind that disruptive technology is not necessarily the same as a technological breakthrough.

Values guide the decisions and priorities of an organization. Values are supposed to be the standards referred to by employees when making decisions, assessing the attractiveness of certain steps. The values of the firms usually revolve around two dimensions: the firm's acceptable gross margins and changes that relate to how a big business has to be in order to be interesting.²⁸ Established universities and colleges like Harvard University have begun to pay more attention to the changing needs of students. Its continuous education programs have remained consistent with its commitment towards quality education. Harvard Extension School identified a market segment whose needs are

not yet satisfied. University of Phoenix also reached a similar conclusion that flexible learning environments can attract a market that was previously untapped. More importantly, large profit margins are realized with this new venture where optimal use of available resources is achieved. Technology advancements have hastened the popularity of lifelong learning. The current economic situation and globalization initiatives of the world have pushed citizens to invest in more education and retraining. Technology has increased the productivity of nations and at the same time shifted industry capabilities and consequently shifted labor demand and relevant skills.

In each organization, whether for profit or not, resources, processes and values are factors that define what an organization can and cannot do. Resources include the people, equipment, technology, brands, information, cash and relationships with customers, suppliers and complementors. A resource can be a thing or an asset that can be bought and sold, hired and fired, depreciated or enhanced. The more a company (educational institutions) can access its resources, the higher is its chance in coping with change.²⁹ Processes refer to an organization's pattern of coordination, communication, interaction and decision-making.³⁰ All the processes illustrate how transformations can be achieved given an organization and the positions of its people. Processes can be classified as formal and informal. Formal processes are documented by the organization while informal processes are the habitual routines or people's ways of working.³¹

It is important for university leaders to be aware that a movement towards change may be difficult for the institutions with processes that are established and people who have been doing the same tasks for a long time. Practices and the people's way of thinking are embedded in an organization's culture and mental models that they are naturally

resistant to changes. For those institutions that have many traditions and practices deeply embedded in their culture, an environment that celebrates change must be planted now. This will be their only way to cope with the changes that are currently being experienced. Higher education institutions must focus on students as customers and partners in structural changes as they continue to instill the importance of value formation in institutions. The incentives and policies of higher education institutions must also be consistent with the new strategy. The evolution will not be immediate, strong leadership, patience and an encompassing strategy must be in place before the change process can be implemented. Losses and disruptions are expected in radical changes and must be handled with great ability by the institutions.

C. Business Model

The economic situation in the US and UK has pushed many working adults to seriously consider applying for short courses due to employers preference for applicants and employees with very specific skills set. At a business model standpoint, educational institutions are most profitable when minimal investments are made on physical infrastructure. Many possible locations can be utilized for face-to-face classroom learning without sacrificing the quality of interaction and learning. Rooms and spaces in universities, malls and office buildings can be leased or rented out. The courses and curriculum can be sourced from professors and from information shared over the web. As network-based technologies improve, the cost of building an effective IT infrastructure is gradually decreasing. Educational institutions do not necessarily have to invest a lot of time and money to garner a respectable reputation and entice students to enroll and apply.

The barriers for new entrants are very low. Advertising and promotion have become less costly due to the wide use of the internet. Basic short courses and other degrees offered by institutions are difficult to differentiate especially when the content of courses offered by different institutions is very similar. This result to competition in terms of pricing and cost enabling institutions that offers the lowest fees to come out victorious.

The higher education industry has left little power to institution as students become more demanding and critical of the value of education. Value for money has become a common theme for students when selecting higher education institutions. Many substitutes are also propping up. Aside from the presence of vocational and technical schools, corporations have invested more funds for their internal training programs and leverage on what they have invested by training other clients and establishing company universities.

The only resource that institutions can really leverage on is their faculty. Universities and higher education institutions can achieve student and market share retention through the faculty that they employ. Although the dynamics of the industry have shifted, faculty still remains to be an important asset therefore institutions must spend and invest in faculty retention initiatives. Smaller institutions however do not have any issues regarding faculty as they seek part-time professors to teach part-time students. As the technology behind distance learning courses advance, the physical presence of a professor might not eventually be necessary.

It will be more effective for new educational institutions to spend little in infrastructure building and focus on operational flexibility instead. These institutions usually offer practical courses, provide flexible programs, offer courses that are taught both

on-line and on-campus, employ experienced professionals as professors and charge low fees to be more profitable and sustainable as it addresses long-term needs of the society.

Major higher education institutions will continue to differentiate themselves from each other and invest in protecting their brand equity. These institutions will continue to spend on physical infrastructure since its target market will continue to value the physical environment of the institution's campus. It has become more difficult for these institutions to increase funds as sponsorships from companies are more difficult to come by. These institutions will continue to seek additional funds from external sponsors and research clients. Faculty will continue to be an important asset of these institutions and consequently capture a considerable share of the institution's costs. In the long-run, these institutions will vary their modes of teaching to accommodate various needs of students.

Higher education institutions feel a real pressure to refrain from increasing their tuition fees. Other sources of funds must be explored and developed to lessen their dependence on student fees. The UK government now looks at endowments as a significant financial resource as universities struggle to accommodate equal access to students. Gifts from students and alumni are a major source of funds for institutions. Distance learning courses and flexible programs will become popular in these institutions as they find ways to increase revenues and profitability without incurring additional costs. For institutions, keeping the best faculty would attract the best students who will most likely contribute to the growth and development of the university in the future. Competition in maintaining faculty and quality student is heightened by the need to maintain the resources of traditional institutions.

For new entrants to the market, the most competitive business model to use must include the following:

- ▲ More application and less theory in teaching
- ▲ Offer short courses and flexible programs
- ▲ Reuse existing classroom resources, lease or rent spaces.
- ▲ Invest on building the IT infrastructure to enable distance learning programs
- ▲ Target working adults, corporations and people eyeing to learn specific skill sets
- ▲ Offer affordable fees and focus on providing value for money
- ▲ Maintain well-know faculty members and invite respectable professionals who want to teach
- ▲ Maintain medium-to-high student standards
- ▲ Continue to explore other technologies that may be useful for learning
- ▲ Affiliation with a respectable university or institution will help in branding, faculty, content and physical resources

CHAPTER VII. Philippine Scenario

What do the trends observed in the higher education sector of US and UK imply about the future of higher education in the Philippines? Is the scenario illustrated applicable to the Philippine situation?

The Philippines has a very unique private higher education that supports 75 percent of the total students enrolled in the country. 80 percent of the higher education institutions are private and are classified as sectarian and non-sectarian. A bulk of the private institutions however exists for the purpose of maximizing profits. This has resulted to low maintenance of quality students and education and merely act as “diploma mills”. Many graduates receive diplomas that do not necessarily represent the attainment of quality education. The top three private institutions have a very stringent application process and normally reject more than 50 percent of the applicants. These universities are usually composed of students that belong to the middle and upper income families, those who can afford the fees of the more expensive secondary schools. Some institutions have established branches in different locations and are controlled by the central institution. Independent schools that offer technical training, short courses and 2-year programs are also found in the country. Many new higher education institutions that are certified by foreign universities and institutions have sprouted as well. Undergraduate and graduate programs are offered by these institutions where courses are either conducted in the classroom or via distance learning.

The courses that higher education institutions offer are demand-driven and this has resulted to similarities in course offerings by various universities and colleges. Most of the

first-degree graduates are in the fields of business, engineering, law, medicine and nursing. This industry dynamic has contributed to the situation wherein the supply of graduates in certain fields exceeds the labor demand. 11 percent of the unemployed graduates experience a lack of job openings in the field of specialization. Skills mismatch is the reason behind one-fifth of the cases and other job seekers find the quality of jobs available too low. Due to lack of adequate jobs, many of the graduates settle for clerical and staff jobs that are well below their capability. Over qualification has become a common theme for some job hunters as employers require a college degree for whatever level and type of occupation.

Pressure to keep costs down is imminent among private institutions since they get to keep the savings and profits. Due to the economic situation of the country, institutions cannot easily raise revenues by increasing tuition fees. Financial loans for students are limited and not within reach. Majority of the expenditures is comprised of administrative and instructional costs. Salaries for the faculty take up the bulk of the costs incurred. Studies show that public institutions have lower teacher efficiency when compared to the teacher-student ratio in private institutions. Private institutions hold large size classes with high class contact with the teachers. It has been discovered that cost-efficiencies are attained by private institutions while public institutions have no real incentives to achieve savings. Although most of the public institutions provide low quality education, many of the students enroll in these schools due to lower tuition fees since these institutions receive government subsidies. There is a risk that private institutions might be crowded out by the public institutions and eventually become a minority player in the higher education sector.

The Philippines is a large exporter of software systems, second to India. Its human capital is its competitive advantage due to the large supply of skilled laborers. It will not be wise for the nation to compete with countries such as China, Bangladesh and Indonesia for unskilled labor. Currently, the Philippine scenario reflects strong engineering skills but considerable lack of talents in science and technology. The labor skills present are more broad than deep and this reflects its weak technological capabilities. “In terms of ‘sunrise’ industries experts foresee a tight supply of high-level, professional skills needed for computers, telecommunications, biotechnology and robotics.”¹ There is a need for the rebuilding of labor skills to help boost the nation’s productivity and economic development.

The Philippine educational system requires only 10 years of secondary schooling, 2 years less than its neighboring countries. This has been identified as one of the weaknesses of the educational system wherein the first two years of college is spent on general subject areas. This weakness can possibly be compensated with extended post-graduate programs. Currently, the nation experiences low demand for post-graduate students in the job market. However employers are looking for people with specific skills and recent knowledge rather than for those with graduate degrees.

Entrepreneurship is now a common slogan carried by the private sector in the Philippines. New business ideas must spurt out of the graduates and educated citizens in the country. Everyone recognize the importance of a boost in the science and technology sector for the future of the country. The educational system though does not really address this need and largely utilizes a theoretical approach in teaching and learning. Many of the large businesses are family ran where the management responsibility is passed on from the

father to children. There has also been an increase in the number of students who pursue further studies outside of the Philippines although a considerable number of businessmen cannot afford to leave the business for graduate studies.

A continuing education institution that is very much similar to Harvard Extension School can be appropriately established in the Philippines as industry barriers to entry are low. Its vision and mission must be directed towards rebuilding the skills and retraining of individuals. More importantly, relevant information regarding the fields of science and technology must be introduced in the courses. The style of teaching will focus more on the application of concepts rather than theory. A more interactive environment and way of learning will be used to raise the level of information and idea sharing.

An affiliation with one of the top universities in the country should be established for the following reasons: to enable use of its classrooms and library resources, to take advantage of faculty experience and reputation, to establish credibility in the community and to complement the existing strengths of the university. In return, the university tapped will earn additional revenues without additional investments in infrastructure, realize an increase in the utilization rate of its resources and enable faculty to reuse existing materials or introduce new materials to the class and earn additional income. There are many professionals in the Philippines who are enthusiastic about teaching but are not able to do it full-time. The establishment of this institution would provide them the opportunity to share practical knowledge about the fields that they are in. The institution should also form alliances with prominent institutions in the US or UK to gain insights and assistance in the establishment of the continuing education institution and its course programs.

The fees must remain low and courses must be flexible. Tangible skills must be gained by the students at the end of the course. Distance learning will also be introduced in some of the courses. Many of the developing countries are trying out distance learning to eliminate high cost infrastructure building for education with the support and encouragement of the World Bank. All the courses must support the students' needs to learn specific skills for the purpose of increasing productivity at work or garnering a higher job position. Courses that are technical and commonly offered by other institutions such as computer programming will not be offered by the continuing education institution since there are plenty of institutions present in the market that already serve these needs. Only courses that contribute to high value added of products, services and operations of industries will be offered.

It will take time to establish this business model. The market has to be prepared for it, political stability must be experienced and government must take a more active role in restructuring the education system in the country. Strong support from the private sector must be established since they are going to serve as important source of funds. Collaboration between universities and higher education institutions must be developed in pursuit of science and technology education and development.

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