Higher Education in an Era of Digital Competition: Emerging Organizational Models

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Abstract

Growing demand among learners for improved accessibility and convenience, lower costs, and direct application of content to work settings is radically changing the environment for higher education in the United States and globally. In this rapidly changing environment, which is increasingly based within the context of a global, knowledge-based economy, traditional universities are attempting to adapt purposes, structures, and programs, and new organizations are emerging in response. Organizational changes and new developments are being fueled by accelerating advances in digital communications and learning technologies that are sweeping the world. Growing demand for learning combined with these technical advances is in fact a critical pressure point for challenging the dominant assumptions and characteristics of existing traditionally organized universities in the 21st century. This combination of demand, costs, application of content and new technologies is opening the door to emerging competitors and new organizations that will compete directly with traditional universities and with each other for students and learners.

This paper describes and analyzes seven models of higher education organization that are challenging the future preeminence of the traditional model of residential higher education. These models are emerging to meet the new conditions and to take advantage of the new environment that has created both opportunity and risk for all organizations, and which demands experimentation of structure, form, and process.

Each of the seven models discussed offers an alternative to traditional residential higher education. Several models are in their infancy. Several others operate at the margin of organizations with other core businesses or priorities. At least one of the models depends upon extensive collaborations. All of the models incorporate features that are designed to enable universities to better respond to new educational demands and opportunities at a national and international level. Taken together, these organizational models are emerging as significant forces in providing education and training, and as powerful competitors to traditional universities. They offer the prospect of rapidly changing where, when, how and for what purpose education is organized within both the corporate and the higher education communities in the United States and throughout the world. The result is a dynamic competitive environment among traditional universities that are adapting learning processes and administrative procedures, alternative nontraditional universities that are adapting technologies to better serve their existing primarily adult

constituencies, and new universities that are being formed around the promise of virtual environments. The thesis of this paper is that growth in worldwide demand for learning is combining with improved learning technologies to force existing universities to rethink their basic assumptions and marketing strategies. This new digital environment is further encouraging and enabling the creation of new and innovative organizational models of that are challenging traditional residential universities to change more quickly and dynamically.

Keywords
Universities and Organizational Models
Virtual Universities
Learning Technologies

I. INTRODUCTION

"On the Internet, nobody knows you are a dog."
(From cartoon showing a dog using a computer [1].)

Sequel to above: "On the Internet, anybody can be a dog." (or, some would argue, a university)

Growing demand among learners for improved accessibility and convenience, lower costs, and direct application of content to work settings is radically changing the environment for higher education in the United States and globally. In this rapidly changing environment, which is increasingly based within the context of a global, knowledge-based economy, traditional universities are attempting to adapt purposes, structures, and programs, and new organizations are emerging in response. Organizational changes and new developments are being fueled by accelerating advances in digital communications and learning technologies that are sweeping the world. Growing demand for learning combined with these technical advances is in fact a critical pressure point for challenging the dominant assumptions and characteristics of existing traditionally organized universities in the 21st century. This combination of demand, costs, content application, and new technologies is opening the door to emerging competitors and new organizations that will compete directly for students and learners.

The recent developments of the worldwide web, digital satellite technology, and new applications of virtual reality to build simulated learning environments are predicted to have particularly dramatic effects upon learning environments at all levels. Universities are experimenting with improving accessibility to existing programs, designing new programs to take advantage of these emerging technologies, and are marketing their programs to new audiences and in new ways. Corporations are also engaged in experimentation and have formed both new organizations internal to the corporation and brand new alliances with universities to promote learning using technology. Completely new models for universities are also being developed to respond to the opportunities created by a growing worldwide market for learning and new technologies. The result is a dynamic competitive environment among traditional universities that are adapting learning processes and administrative procedures, alternative nontraditional universities that are adapting technologies to better serve their existing primarily adult constituencies, and new universities that are being formed around the promise of virtual environments. The focus of this paper is upon baccalaureate and advanced level universities, but the conclusions may also be applicable for two-year community and technical colleges.

Conceptually, this analysis views higher education as an open system with advanced learning as its core purpose. The system has evolved into a highly complex set of institutions that have organized to achieve this core purpose. Throughout the industrial era, the system has focused upon serving the educational needs of youth to prepare for a lifetime of work. Today it is clear that the future will involve a lifetime of learning in order to work.

Baldridge and Deal [2] argue that to understand opportunities for change in universities, one must understand that the external environment is by far the most powerful source of internal change. Toffler [3] suggests that developed organizations change significantly only when three conditions are met. "First, there must be enormous external pressures. Second, there must be people inside who are strongly dissatisfied with the existing order. And third, there must be a coherent alternative embodied in a plan, a model, or a vision." The first two of these conditions certainly describe higher education as a system, and they also apply to many institutions. The third of these conditions is the focus of this paper, which is an initial attempt to analyze a very complex and rapidly changing environment and suggest alternative visions and models that are emerging in this environment.

Seven emerging organizational models of higher education are described and analyzed. These models are all designed to meet growing demand among learners for improved accessibility and convenience, lower costs, direct application of content to work settings, and greater understanding of the dynamic complexity and often interdisciplinary nature of knowledge. Each model complements and offers an alternative to traditional residential higher education. Several models are in their infancy. Several others operate at the margin of organizations with other core businesses or priorities. Each of them represents organizational efforts to respond to new educational and learning opportunities at a national and international level. And each of the models offers important new options in an education and training marketplace that is increasingly global in scope and of critical importance to individuals, organizations, communities, and governments.

Taken together, the seven organizational models may become significant forces in providing education and training, and powerful competitors to traditional residential universities. They offer the prospect of rapidly changing where, when, how and for what purpose education is organized within both the corporate and the higher education communities in the United States and throughout the world. Experimentation with these organizational models will affect and change current methods of evaluating institutional and program quality. The experience gained within and across institutional models will also influence a redistribution of over-all power and decision-making in higher education. The net effect for the future is that institutions of all types will be more responsive and accessible to their customers, more adaptable in their programs, and more capable of change than they currently are.

The models discussed are derived from analyzing trends, characteristics and examples of emerging organizational practice. They include:

A. Extended traditional universities
B. For-profit adult-centered universities
C. Distance education/technology-based universities
D. Corporate universities
E. University/industry strategic alliances
F. Degree/certification competency-based universities
G. Global multinational universities

While the more than three thousand traditional institutions in the United States vary greatly in mission, size, curriculum, selectivity, faculty expertise and background, level of offerings, and type of location, they share a number of characteristics that serve to define them. Because these characteristics are widely

accepted and understood, they offer a point of departure for this analysis. The basic characteristics that help to define traditional universities and colleges are the following:

1. a residential student body;
2. a recognized geographic service area from which the majority of students are drawn. This service area can be a local community, a region, a state, and in the case of a few elite institutions, a nation;
3. full-time faculty members who organize curricula and degrees, teach in face to face settings, engage in scholarship, often conduct public service, and share in institutional governance;
4. a central library and physical plant;
5. non-profit financial status;
6. evaluation strategies of organizational effectiveness based upon measurement of inputs to instruction, such as funding, library holdings, facilities, faculty\student ratios, faculty qualifications, and student qualifications. (See Table 1 for a more complete analysis)

In traditional universities, students attend campuses with classrooms where a primarily full-time faculty teaches. Many traditional universities attract students from across the globe, but they are not global universities because students must come physically to a campus that operates within a recognized geographic service area and within a specific local cultural context. Traditional universities differ in one or more fundamental ways from each of the models analyzed in this chapter.

From an evaluation perspective, traditional universities are concerned with measuring inputs to the instructional process, such as the institution's mission, funding, curricula, faculty experience, student quality, adequacy of facilities, and governance structure. The concept behind this approach is that, taken together, these inputs are effective indices for organizational effectiveness and indirectly measure anticipated student learning, more so than single measures of student learning based upon final examinations that are common practice in European universities. Perhaps of greater importance, they help to define the status of the degree awarded, and therefore the value of the degree in the marketplace. These inputs, assumptions related to evaluation, and selected implications suggested by practice and culture within universities are noted below in Table 1.

Input Measurement	Characteristics and assumptions of traditional residential institutions of higher education
Philosophy	Students come to campus
Mission	Mission defined by level of instruction--offering graduate level programs often implies increased quality, as does student and faculty selectivity
Funding	Measured by $ expended per full-time student equivalent
Curricula	Relatively stable and comprehensive curriculum
Instruction	Primarily face-to-face lecture, teacher-centered formats prevalent at undergraduate level. Instruction is measured by clock hours of seat-time (Carnegie units of credit) and evaluation of student content acquisition; seminars at graduate level
Faculty	Full-time faculty; faculty preparation and credentials, research productivity, and external grants imply increased instructional quality
Students	Greater selectivity at admission suggests higher quality programs—very little measurement of change in overall learning from entry to exit
Library	More volumes in library, with greater depth of disciplinary holdings, implies greater quality (although with advances in electronic sharing of resources this assumption is beginning to be challenged)
Learning	Generally used to supplement or enhance lecture format; tiered high technology

Technology	lecture halls are one example
Physical Facilities	Central physical plant includes residence halls, student unions, health facilities, classrooms, and campus environment, which together are believed to add to the quality of the education received
Productivity Outcomes	Productivity is measured in student credit hours and degrees. Student credit hours are measures of classroom seat time and content acquisition; degrees are measures of completion of pre-approved courses
Governance	Independent Board of Trustees--Independence from political or business environment is a goal
Accreditation	Institutional by region; individual programs or disciplines are also accredited by professional accreditation associations

Table 1. Characteristics and Assumptions of Traditional Residential Institutions of Higher Education

The fundamental assumptions and major characteristics of traditional universities noted in Table 1 emerged during the 19th century in the industrializing countries. The organization of traditional universities, especially in the United States, responded to the need for increased access, discovery of scientific and applied knowledge that could advance industrial and agricultural productivity, and education and acculturation of a diverse community of learners. The basic assumptions and characteristics of these traditional universities were developed, refined, and implemented during the 20th century and in general have not been seriously challenged. However, as the decade of the 90's draws to a close, many national higher education associations and organizations have noted and called attention to dynamic economic, social and technological changes occurring throughout the world. They have further noted the emerging promise (and threat) of new learning technologies applied to traditional residential universities. These associations have developed conferences and study groups on learning technologies, on teaching and learning with technology, on the purpose and functions of universities, and on their impact on the economy. More universities in the United States are becoming involved in using technologies to deliver courses at a distance, and almost all universities with existing programs are planning expansion. Such discussions and actions have been encouraged by recent predictions by notable authorities such as Peter Drucker, Eli Noam, and Burks Oakley that universities will change radically or perhaps even cease to exist in the 21st century [4][5][6].

II. THE DEMAND FOR ADULT LEARNING

Organizational patterns of universities are being affected by the development of new learning technologies and also by an increase in demand for learning, primarily from adults who must learn continuously to stay current in the workforce. Increasingly, the marketplace for learning by adults is defined as lifelong education and training that keeps people current in their professional lives and stimulated in their personal quests. Clearly, the higher education market can no longer be defined solely as preparation for a career or for life with a focus on the 18-22 year old student, as has been the case for most of the 20th century.

The adult learning marketplace is increasingly competitive and full of opportunity, both for existing institutions and for new entries.[7][8][9] The market is growing and new technologies dramatically improve access to learning resources and offer the potential of linking learners and teachers in completely new ways[7]. Demand currently exceeds supply in this dynamic new market [10][11]. Like most rapidly developing markets where practices are not yet proven, many organizations are feeling their way, sometimes making enormous but risky investments and sometimes hedging their bets by minimizing risks.

A 1995 study by the National Center for Education Statistics found that a third of higher education institutions offered distance education courses in fall 1995, another quarter planned to offer such courses in the next 3 years, and 42 percent did not offer and did not plan to offer distance education courses in the next 3 years[12]. Only two years later in a study of 44 universities with distance education programs, 95.3% of the colleges with an established distance education program planned to expand the program. Among reasons for expansion, meeting greater demand, staying competitive, and serving new markets were the three most frequently cited motivations. At the same time, 40% of college distance education programs in this same study reported operating at a loss [13].

III. EMERGING AND NEW MODELS

Emerging and new models differ in one or more significant features from the traditional model for higher education. Beginning with the **Extended Traditional University** model that most resembles the current assumptions and operating framework in place in the core programs of residential universities and colleges, the seven models outlined in this paper represent a variety of possible organizational strategies. Each of the alternative models, while allowing for some overlap, presents at least one major challenge to existing assumptions about what higher education is and what it should be in the future. The goal of each model is to overcome one or more perceived weaknesses of the traditional university campus by changing fundamental assumptions about what a university should be and how a university might operate in a global education and training marketplace in the 21st century.

A. Extended Traditional Universities

The emerging marketplace for learning clearly includes traditional non-profit universities and colleges that seek to capture the growing adult learning market. Such institutions have dominated youth-oriented higher education for a century, and some of the more aggressive and comprehensive universities have a long history of offering significant programs for adults, usually operated at the margin of the institution. Beginning with William Rainey Harper at the University of Chicago before the beginning of the 20th century, universities such as Penn State, New York University, UCLA, and the University of Wisconsin built large semi-autonomous extension units designed to serve adults. More recently, regional universities, urban private universities, and community colleges have responded to changing demographics by developing educational programs for adults.

Extended traditional universities, as defined in this study, are characterized by programs of traditional universities that are specifically organized and designed to serve a primarily adult audience that is usually non-residential in nature. **The traditional university operates as a parent organization**, serving as a sponsor for programs conducted for this "alternative or nontraditional" constituency or clientele. Such programs do not threaten the basic academic organization of the university, but they do serve a different market, one that is primarily external. Most efforts of extended traditional universities have centered on marketing and delivering existing on-campus courses and programs to adult audiences. These efforts have usually been assigned to a continuing education or extension division, either at the institutional level or at a program level. The continuing education division or program within a traditional university operates using assumptions that diverge from the parent university organization in subtle but important ways. Table 2 illustrates ways in which the extended traditional university modifies assumptions and characteristics of its parent organization.

Input	Traditional universities	Extended traditional universities	For-Profit adult-centered universities
Philosophy	Students come to campus	Campus goes to students	Campus and non-campus philosophy
Mission	Mission defined by level of instruction	Externally focused, degree completion and workforce development	Almost exclusively workforce focused
Funding	$ per full-time student	More self-sustaining and market driven	Market driven, workforce focused, and profit driven
Curricula	Relatively stable & comprehensive curriculum	More flexible curriculum content for workforce competence and development	Focused on workplace needs; adult oriented
Instruction	Most courses are lecture based	Greater variety of methods and use of student experience	Methods typically standardized across locations--greater use of student experience
Faculty	Primarily full-time faculty; academic preparation and credentials,	Greater use of adjuncts with professional experience	Usually staffed with part-time faculty with professional experience
Students	Selectivity at admission	Life and work experience is greater factor in admission	Life and work experience is significant factor in admission
Library	Volumes in library	Access to specific documents and resources appropriate to program	Access to specific documents and resources appropriate to program
Learning Technology	Enhance lecture-oriented instruction	Both lecture oriented and used to extend access	Both lecture oriented and used to extend access
Physical Facilities	Extensive physical plant	Still campus based but less reliance on physical plant	Physical plant is provided in response to market demand
Productivity Outcomes	Student credit hours and degrees.	Student credit hours and degrees	Bottom line is revenue generated compared with expenses--profitability
Governance	Board of Trustees	Board of Trustees	Board of Directors
Accreditation	Institutional by region; individual programs or disciplines are also accredited	Institutional by region as part of parent organization's accreditation; individual programs or disciplines are also accredited	Institutional by region; individual programs or disciplines are also accredited

Table 2. Comparison of For-Profit Adult-Centered Universities, Extended Traditional Universities, and Traditional Residential Universities

As noted in Table 2, the continuing education or extension unit operates within the basic value set and organizational structure of the product and programs of the University. The primary mission of the unit is to make the product or set of programs offered on the campus available to people unable to attend regularly scheduled classes because of schedule or location. Continuing education units are concerned

with improving access for audiences unable to attend the campus, and their students usually attend parttime and are older working adults who are viewed by the dominant university culture as distinct from its major 18-22 year old constituency.

Generally, units serving adults are far less dependent upon subsidy from the parent organization, and often are completely self-sustaining or even required to generate funds to support the rest of the institution. Because they depend upon revenue more than traditional university offerings, they tend to behave in a more market-responsive manner. In short, they tend to be more customer driven than content driven, and external needs receive greater priority in program decision making than does internal readiness or support.

As continuing education units gain experience in using technology to adapt programs to meet student needs for access, convenience and flexibility, their influence can be expected to increase, and their value to the parent organization may also grow, especially in those universities that have committed themselves to long-term change. And as technology permeates traditional institutions, blurring of the boundaries between types of students, core-teaching locations, funding bases, and instructional methodologies is occurring. This blurring of boundaries is creating both institutional stress and opportunities for reframing and restructuring missions and programs. As a result, the distinctions that have been prevalent between continuing education organizations and programs and their parent institutions are breaking down, with both the role of the continuing education unit and the mission of the institution being changed in the process.

Examples of Extended Traditional Universities

Washington State University created the Extended Degree Program and WEB University, where several degree programs are offered to students beyond the campus and more than 70 courses have been developed on the Web for offering both on and off campus as of Fall, semester, 1997. In a statement to the legislature outlining projected programs for the 1997-99 time period, WSU envisioned "re-engineering" courses to integrate multimedia presentations that will utilize sound, video, slides and animation as part of normal lecture presentations. Other classes would be converted so that students would use technologies like the World Wide Web and electronic mail to learn, giving them the flexibility of internet-based instruction they can receive where and when they want it. WSU predicts these transformed classes of Web University will improve the utilization of physical facilities on campus. For instance, students will be able to take some classes without leaving their dormitory room. Additionally, most "re-engineered" courses will be suited for electronic export via satellite, Internet, or a K-20 Network. Many others could be easily transferred from Pullman and branch campuses to new "Learning Centers" located in many communities in Washington. The Web University will allow the university to enhance learning and improve student outcomes while increasing access by:

1. Optimizing the utilization of campus based physical facilities by enrolling residential students in asynchronous courses.
2. Expanding the reach of the geographically dispersed branch campuses and learning centers to address the needs of place bound students.
3. Enrolling students pursuing degrees or certificates at living-learning spaces off campus [14].

Penn State University has created the World Campus, beginning with several specific degree programs for which the University has special expertise. The World Campus, according to its President, Graham Spanier, will "not be built with brick and mortar but with the creative use of technology led by our faculty to extend selected programs nationally and internationally. Through this approach, we anticipate propelling Penn State's expertise not only to every citizen of Pennsylvania but potentially to new students globally" [15]. With assistance from the Sloan Foundation, the University expects the World Campus to be under way by early 1998, offering selected courses in fields such as engineering, geographic

information systems, chemical dependency, counselor training, anesthesia case studies, advanced power engineering, and turf-grass management. Penn State projects that by 2002, more than 30 certificate programs, degree programs, and continuing professional education modules involving more than 300 individual courses will be available [16].

The University of Wisconsin has created the Center for Learning Innovation, a self-funded freestanding organization whose purpose is to develop and commercialize university created educational software and programs. The Center is intended to provide a competitive advantage by developing "critical resources necessary to effectively market, develop, distribute, and support technology-enabled learning products and services on behalf of the entire UW System." … "Such support is different from that available for students sharing a common schedule at a campus. Asynchronous distance learning on a global level requires access to support around the clock and services provided at a distance. It is more efficient to have such service available centrally to the institutions than to have them each develop this capacity"[17].

California State University has created the CSU Institute for similar purposes. The goal of the Institute is to enable CSU campuses and faculty to capture market advantage for their academic and educational software and off-campus programs. The CSU Institute with less than four years of history is the oldest systematic and system-wide effort of its type in the United States. Its ventures are developed in collaboration with the CSU campuses and are designed to contribute to California's economic development and to generate revenue.

Its specific purposes include:

1. Develop and commercialize the intellectual assets of the CSU.
2. Foster mechanisms to fund further research and development.
3. Assist in obtaining patents and licenses,
4. Administer commercialization and marketing efforts, and manage intellectual property.
5. Develop strategic alliances by linking participating campuses, governments, and business partners into strategic alliances.
6. Facilitate the delivery of education and training to non-CSU audiences.
7. Provide "one-stop shopping" consulting service to business, industry, government, and other countries.
8. Provide development services for economic growth.
9. Pursue business opportunities within and for CSU's large and distinct market.
10. Capitalize on CSU's large capital assets [18].

The examples cited are all indicative of the high level of state and national attention given to adapting traditional universities to this new competitive environment. They each represent efforts of state systems and multi-campus investments of resources, and taken together commit millions of dollars to these new endeavors. Each University has received the support of its Board of Regents and operates with strong endorsement from its president.

Several examples are offered of single institutions developing responses to this new and changing environment. Each example reflects a particular campus and institutionally determined set of assumptions and organizational framework, and further illustrates the diversity of approaches being employed by extended traditional universities operating within a parent organizational framework.

Virtual Michigan State University offers selected courses online. These courses are clearly exploratory with little programmatic organization. This approach is common among many universities that have taken note of new technologies but have not committed whole-heartedly to using them systematically to develop complete programs offered at a distance.

New York University operates one of the largest continuing education programs in the United States. The School of Continuing Education at NYU has an annual enrollment of more than 60,000, and serves a diverse mix of students, including some 3,000 international students representing more than 120 countries. NYU lists more than 30 courses offered via the Web in the fall semester of 1997, and has initiated Virtual College to enroll students who wish to study online.

The University of California-Berkeley Extension is offering 60 courses online in the fall of 1997 with 175 online courses expected to be available by the end of 1999. University Extension offers credit courses and certificates but does not offer a degree online. UC-Berkeley-Extension is a completely self-supporting unit and is able to direct its own curriculum development with very broad guidelines and latitude provided by its parent organization.

Many other examples of exploratory efforts to adapt programs to serve a growing marketplace could be cited. Despite examples of increased experimentation such as those noted above, however, most universities have not challenged traditional assumptions and approaches with respect to learning, students, and processes. It is primarily continuing education programs and divisions that have become sufficiently entrepreneurial to be successful in serving the adult market. In some cases their budget, enrollments, and impact exceed that of most if not all other units within the University. Instructional technologies have enabled many of these units to expand their efforts to provide improved access to campus-based programs, but the impact is not yet widespread throughout the University. Despite this success in serving a rapidly expanding adult market and in adapting new technologies to better serve this market, their influence on core programs, operating assumptions, and values remains low. Their capacity for adapting to changing markets is often resented rather than appreciated by campus-based faculty, staff, and students, who see such efforts as diverting precious resources, offering lower quality education, threatening time-honored conceptions of teaching and learning, and diminishing the status of institutions.

Olcott (1997) states:

> . … .despite some remarkable success stories, the transformational capacity of technology to reshape the modern academy's teaching and learning processes has fallen well short of its earlier promise. Moreover, while the geographical boundaries of educational access have been rendered obsolete by technology, the "real" boundaries of turf and traditional service regions remain and are driven by political and economic factors rather than by educational priorities. Parochialism remains the dominant mindset for most institutions [19].

A key goal of extended traditional universities is to change the locus of decisions about educational programs, priorities, budgets, and students in ways that are more responsive to students and their immediate and lifelong needs. In short, the basic idea of the extended traditional university, however it may be organized, is to enable the parent university to respond more ably and nimbly to what students, the adult marketplace and the university's publics say they want from their university. In doing so, the university will be less inclined to base important decisions about programs and priorities strictly upon considerations of content and program quality, or other largely internally driven criteria. In fact, leadership for development of the extended traditional university is coming most often from outside the core activities of the faculty, and in many cases, far away from the internal center of the institution where the majority of learning and teaching occurs. As long as this is the case, traditional universities will be slow to embrace the integration of necessary changes required for academic departments and faculty to take advantage of new program opportunities. One of the most important and immediate but intensely challenging tasks for the traditional university is to develop additional strategies for building leadership capacity for change and decision-making structures that support change at the faculty level.

B. For-Profit Adult-Centered Universities

The marketplace for adult learning is increasingly attractive to existing and new for-profit universities and organizations and private businesses [10][11]. For-profit institutions of higher education have carefully delineated a focused educational market [8]. These institutions are substantially different than traditional nonprofit institutions of higher education, whether public or private**.** They derive almost all of their operating revenue from the tuition and fees that students or their employers pay, and they are also expected to return a dividend to investors who have provided the capital to create them. They are very responsive to the demands of the educational marketplace, but, unlike traditional universities, the marketplace they serve is largely career oriented.

Because for-profit adult-centered universities operate based upon the bottom line, they are also highly focused on developing and expanding programs that attract large numbers of students, or offer entry or advancement to fields where employment is both plentiful and lucrative. For-profit universities develop market-driven programs with standardized curricula. Programs are then offered in many cases across multiple locations. Programs are almost always career focused; they typically offer courses that enable students to either enter a technical career or to advance to new management responsibilities. They make minimal investments in expensive physical plants. Their student services are generally basic learning centers with few frills. For better or worse, they sponsor no football team or intercollegiate sports program. While they do not offer a full complement or alternative to the traditional university, they are formidable competitors to universities (including, in this case, community colleges) that are, or that seek to become, responsive to the adult marketplace. Table 2 illustrates the dominant characteristics and assumptions of for-profit institutions in relation to both the extended traditional university and the traditional university. It should be noted that the frame of reference for comparison for the extended traditional university is the set of assumptions and characteristics for the traditional university as the parent organization.

Examples of For-Profit Universities

The University of Phoenix offers traditional classroom-based instruction at the undergraduate and graduate level in many states. With enrollment growing from zero to more than 57,000 students in less than 25 years, it is the largest and most successful of the U.S. based for-profit adult-centered universities. Most students attend classes in learning centers located in urban areas in more than a dozen western states. Enrollment in its learning centers is growing almost 28 percent per year, and enrollment in its online courses and programs grew 51% in fiscal year 1997. Approximately 3200 students are now enrolled in its online courses and programs, which includes one of the first online MBA programs in the United States. The University of Phoenix is also rapidly expanding programs that serve corporations. For example, it has developed a contract with AT&T to provide academic programs to AT&T learning centers worldwide [20].

Strayer College is a regional proprietary institution of higher learning offering undergraduate and graduate degree programs to more than 9,000 students at nine campuses in Washington D.C., Northern Virginia, and Maryland. In November 1997, its board of directors awarded a 3 for 2 stock split on top of its regular annual dividend to shareholders. Unlike the University of Phoenix but like many of its for-profit counterpart institutions, Strayer College has not yet invested heavily in delivery by technology.

Education Management Corporation operates for-profit educational programs that have provided career related education for more than 35 years. The Company offers associate and bachelor degree programs and non-degree programs in the areas of design, media arts, culinary arts, fashion and professional development. Its units include: The Art Institutes, The New York Restaurant School, The National Center for Paralegal Training, and The National Center for Professional Development. At the start of the

current fall quarter, 1997, total enrollment at Education Management's 15 company-owned schools increased 18.5% to 18,763 from 15,838 in the comparable period in 1996.

Educational Medical, Inc. provides diversified, career-oriented post-secondary education to approximately 6,500 students in 18 schools located in nine states. The Company's schools offer diploma and/or associate degree programs designed to provide students with the knowledge and skills necessary to qualify them for entry-level employment in the fields of healthcare, business, fashion and design, and photography.

Sylvan Learning Systems, Inc. is a provider of educational services to families, schools and industry. It also delivers computer-based testing for academic admissions, as well as for professional licensure and certification programs at more than 1,300 testing centers. The Company also maintains a network of more than 640 Sylvan Learning Centers that provide personalized instructional services to students of all ages and skill levels. Sylvan also provides educational services under contract to public and non-public school systems through the Sylvan Contract Educational Services division, and provides adult professional education and training through its Caliber Learning Network. Revenues for Sylvan Learning Systems grew by more than 40% in fiscal 1997.

C. Distance Education/Technology Based Universities

Keegan categorizes distance education universities as originating from two distinct traditions [21]. The first of these traditions is correspondence study, and the second is the extension of traditional classrooms to new locations through the use of new technologies such as satellite, broadcast television, cable television, and more recently, compressed video and desktop video. More recently, a third category of institution has emerged that does not neatly fall into either of these traditions. Using asynchronous learning and taking advantage of new computer mediated conferencing systems and the emergence of the world-wide Web, online universities offer a third model organized around a technology approach.

The distance education/technology-based universities are all organized around a technology-based approach to learning that seeks to minimize the physical separation of the learner from the instructor or from other learners. They also tend to be more adult and workforce oriented, although the large national universities enroll substantial numbers of traditional college-age students largely due to the incapability of traditional universities, especially in countries with rapidly growing populations. Table 3a notes major differences between the distance education/technology-based universities and both traditional and extended traditional universities. Table 3b captures major differences among types of distance education/technology institutions along selected characteristics and assumptions that serve to differentiate the type of institution.

Input	Traditional universities	Extended traditional universities	Distance education/technology-based universities
Philosophy	Students come to campus	Campus goes to students	Campus goes to students
Mission	Mission defined by level of instruction	Externally focused, degree completion and workforce development	Externally focused, degree completion and workforce development
Funding	$ subsidy per full-time student	More self-sustaining and market driven	Reduce cost of access to higher education
Curricula	Relatively fixed & comprehensive curriculum	More flexible curriculum content for workforce competence and development	More flexible curriculum-content for workforce competence and development

Instruction	Most courses are lecture based	Greater variety of methods and use of student experience	Varies by type, See Table 5
Faculty	Primarily full-time faculty; academic preparation and credentials,	Greater use of adjuncts with professional experience	Some use of full-time faculty but with greater use of adjuncts with professional experience
Library	Volumes in library	Access to specific documents and resources appropriate to program	Access to specific documents and resources appropriate to program
Students	Selectivity at admission	Life and work experience is greater factor in admission	Life and work experience is greater factor in admission
Learning Technology	Enhance lecture-oriented instruction	Both lecture oriented and used to extend access	Varies by type, See Table 5
Physical Facilities	Extensive physical plant	Still campus based but less reliance on physical plant	No physical plant--students are geographically separated from each other and the instructor
Productivity Outcomes	Student credit hours and degrees.	Student credit hours and degrees	Varies by type, See Table 5
Governance	Board of Trustees	Board of Trustees	Varies by type, See Table 5
Accreditation	Institutional by region; individual programs or disciplines are also accredited	Institutional by region; disciplines and programs also part of parent organization's accreditation	Varies by type, See Table 5

Table 3a. Comparison of Distance Education/Technology Based Universities with Traditional Universities and Extended Traditional Universities

1. Correspondence Tradition

Many distance education universities have developed from a print and correspondence tradition, and were primarily established to increase access to higher education.   They are usually operated as governmental entities and were originally organized to serve a national development function. Daniel [22] refers to these universities as "mega-universities." Several of these universities have enrollments that number in the hundreds of thousands.

The British Open University is the best known of these national universities that utilize traditional distance learning methods such as correspondence, audiotapes, and videotapes.   Generally the pedagogical method employed by distance education national universities is a student studying independently of other students, working with an instructor who guides the student in his or her learning activities and courses. Most of these universities were established in the past 30 years, and they are rapidly adapting their content and delivery to new technologies, markets, and alliances.

In North America, the largest of these universities is Athabasca University in Alberta, Canada. Established in 1972 using correspondence study and primarily non-interactive supplementary technologies such as audiotape and videotape, Athabasca now enrolls more than 16,000 students at a distance. In 1994 its Centre for Innovative Management launched an online MBA. This program is currently Canada's sixth largest MBA program, and its educational framework signals a direction likely to develop for other programs. The program emphasizes service to students, its ability to change courses

and even the curriculum quickly to respond to changing circumstances and needs, and the development of student skill sets necessary for success in the corporate world. While the program currently is focused upon Canada and North America, courses are also offered in Japan, and discussions are underway to extend the program to other countries.

In China, three distance education universities, the Shanghai TV University, Jiangsu Radio and TV University, and the China TV University System (CTVU) enroll more than 1.5 million students annually. CTVU alone has graduated more than 1.5 million students during the past decade, which represents 17% of China's total number of college graduates during this period [22]. Unlike many other of the distance education "mega-universities," students at CTVU attend scheduled classes broadcast to classrooms at their place of employment [23].

Sukhothai Thammathirat Open University (STOU) in Thailand is a government sponsored university that enrolls almost 200,000 students annually in degree programs and an additional 300,000 in short training programs and single courses. More than three-fourths of the students are from rural areas of Thailand. More than 47 baccalaureate degrees, three graduate programs, and a number of certificate programs are offered through STOU [22].

The Centre National d'Enseignement à Distance (CNED) operates under the authority of the Ministry of Education in France and is the largest distance teaching university in Europe. Operating at all educational levels using a primarily correspondence education approach, CNED also uses satellite delivery to supplement its educational program via correspondence. "The reality appears to be that CNED is using its most glamorous technology, satellite video transmissions, to enrich rather than fundamentally to change, its traditional correspondence teaching methods" [22].

In the United States, Empire State College in New York and Thomas Edison State College in New Jersey closely resemble the national distance education university model common in Europe and Asia. Both receive state funds and are based upon a historical foundation of independent learning and self-study. Hall [24] compares Empire State College with the British Open University and acknowledges the direct influence of the BOU on Empire State's development. He analyzes the approaches to the establishment of both institutions and finds few differences other than scale, with ESC being a state university and BOU national in its orientation.

National distance education universities were established in many countries struggling to meet increasing demand from rapidly increasing populations and also to pay for improved access to higher education necessary to compete in a new global economy. In that sense, these distance education universities function as a release valve for traditional campus-based higher education, for which the number of available positions or student slots is woefully inadequate. The origination of national distance education universities occurred for somewhat different and more immediately political purposes than other models outlined in this paper. They also suffer from significant government control and bureaucracy and are not able to accommodate change easily, let alone lead new developments and applications. While they are large, and significant for that reason, they are unlikely to be able to adapt their instructional approaches quickly in a dynamic environment.

2. Extended classroom tradition
Just as the distance education national universities were originally organized to take advantage of improved mail delivery, several universities have been organized specifically to take advantage of a particular delivery technology while overcoming other organizational weaknesses of traditional universities. The extended classroom tradition assumes that face-to-face instruction in traditionally structured teacher-centered classrooms where students can interact with each other and with the instructor is a preferred mode of learning, even at a distance. The extended classroom connects learners who are

separated from each other and the instructor through the use of connective technologies such as satellite or two-way video and audio systems. The extended classroom tends to be the most traditional of the approaches to distance education; very often the class members learning at a distance are simply connected to a regular on-campus classroom and are taught as part of the extended class. In all cases, the benefit is that the student does not need to commute to the campus. However, students and faculty members must generally conform to other requirements such as designated meeting times, and sometimes, a location to which students must commute to in order to participate.

Numerous examples of the extended classroom tradition have developed across the globe over the past 30 years as technologies have increasingly enabled two-way interactive video and audio communication among multiple locations. The extended classroom tradition has flourished, particularly in fields where changing professional practices require continuous updating and where professionals are geographically dispersed. The extended classroom tradition builds upon assumptions regarding faculty, content, and teaching and learning, and therefore presents a less dramatic departure from assumptions otherwise present in traditional universities. While the cost of implementing these interactive technologies is high and cost-recovery in most cases is not possible, many traditional universities with programs in selected fields of professional study have made these programs available through this extended classroom format within a specific area they serve. In many cases they have justified costs by comparing this method of delivery with costs necessary to establish new full-service campuses and programs which otherwise might be required to respond to the need.

New universities and consortia of universities have also formed around the extended classroom tradition. One example is the National Technological University, which was originally framed around national satellite broadcast technology to deliver graduate level engineering masters degree programs to practicing engineers located in business and industry. The program combines faculty expertise and course offerings at a number of leading U.S. Colleges of Engineering. By allowing courses from multiple universities to be organized and counted toward a degree, regardless of the institution originating the course, NTU meets a need for portability of credits toward a degree for mobile engineers who are often transferred across the country by their employers. Courses of NTU are generally taught in a traditional lecture classroom format and are delivered to groups of students who are employed at participating corporate locations; the technology simply allows for enlargement of the on-campus lecture hall across distance. NTU offers its own degrees, and has been accredited to do so by the North Central Association since 1987. It has also expanded its programming by offering certificates, selected baccalaureate degree programs, and noncredit professional development workshops.

Other consortia in the United States have been organized to combine resources to deliver educational programs using the extended classroom tradition, but none has been as successful as NTU, nor has any other consortium developed its own accredited degree program.

The National Universities Degree Consortium (NUDC) is a consortium of 13 separately accredited universities across the United States working together to offer over 1,000 courses, 3 credit certificates, 11 baccalaureate degree programs, and 24 graduate degree programs through distance education. Courses include videotape and print based independent study and correspondence study courses. Most courses are available directly from the individual members of NUDC. NUDC has not been able to generate programs that stand separately from its member institutions, although it has been able to facilitate substantial cooperation in sharing courses, student services, and marketing.

3. Emerging online web-based universities

With the development of computer conferencing systems and the worldwide Web, many new online universities have been established in just the past five years. These universities are coming into existence specifically to utilize new web technologies that support learning independent of time, location, and

distance, but allow for students to study together. They offer opportunities for students to learn through asynchonous intereaction with each other and a faculty member. A classroom environment with student and faculty interaction is created, but students are not all in the classroom at the same time. On-line universities define their competitive market advantage based upon the convenience of electronic computer based access they provide to specific programs. Unlike the national distance learning universities, which have a historical tradition tied to correspondence study and the post office, these new universities focus on the use of new technologies to provide not only improved access but also improved interaction between and among students. While their numbers are relatively few, and their structure is evolving rapidly, following is a list of exclusively online universities and organizations with the name of university currently available on the Web.

- Athena University
- California Coast University
- American Coastline University
- Commonwealth Open University
- Cyber State University
- Greenleaf University
- Kennedy Western University
- International University
- Open University
- Southern California University of Professional Studies
- Virtual Online University

Of course, few of these universities are accredited, and some may never be. Their numbers do illustrate the idea expressed at the beginning of this paper, however, that on the internet, not only can "anybody be a dog.," but also that anyone can be a university as well.

As one example of the online university, International University (IU) is a not-for-profit university owned by a for-profit company, Jones Cable. IU was established by Jones Cable CEO Glenn Jones in 1995. International University offers an online undergraduate and graduate degree in business communications. Enrollments in the program are small, but International University's affiliation with other Jones companies that market the program in the US and in Europe give the university a substantial base for program delivery and enrollment growth. IU was approved as a candidate for institutional accreditation in March of 1997 by the North Central Association, the regional accrediting organization for the midwest states, making IU the first entirely online institution to receive this status.

Magellan University was established in 1993 to use the tools of the internet to deliver education beyond the boundaries of the conventional college campus. The institution's motto, "Excellence in Education, Anywhere, Anytime," undergirds its intention to make programs available worldwide. To date, only courses have been offered, but the intent is to develop degree programs in the future.

Distance education/technology based and online institutions may be state funded (such as Thomas Edison in New Jersey), privately held (such as International University), or they may be organized as a consortium institution (such as National Technological University) which offers engineering degrees by satellite. They may be focused upon a state, a country, a national, or an international market; whatever market they select, their focus is on reaching that market through providing remote access to the programs they offer. While all distance education/technology based universities share many characteristics, as noted in Table 3a, Table 3b illustrates selected differences among these three types of distance education technology-based institutions with respect to funding, technologies employed and instructional approaches utilized, and productivity measures.

Input	Correspondence tradition	Extended classroom tradition	Emerging online/web-based universities
Funding	National and state investments common	Industry often a driving force in funding programs	Tuition and industry funding likely to drive funding
Instruction and learning modes	Most courses are print and readings based, interaction between instructor and student only	Greater variety of methods, including real-time, student-student, and student-instructor interaction	Courses are online on the WWW, interaction among students and with instructor occurs asynchronously and in real time using computer conferencing; use of other technologies as appropriate
Readings	Print syllabi and readings often provided	Print syllabi and readings often provided	Online access to specific documents and resources appropriate to program
Productivity Measures	Costs per student compared with traditional higher education	Dependent upon funding model selected, but access to instruction is a key consideration	Not yet established, but revenue generation and cost reduction are two probable criteria
Learning Technology	Generally one-way technologies to enhance lecture-oriented instruction	Generally two-way technologies to enhance simulation of face-to-face classroom environment	Generally two-way interaction supplemented by online instructional references and resources

Table 3b. Comparison of Major Differences Among Types of Distance Education/Technology Based Universities

D. Corporate Universities

During the 1980's a number of corporations established umbrella organizations to provide for the corporation's comprehensive human resource development, education and training needs. Their reasons for developing comprehensive training and educational programs included the need to develop basic educational competencies in the workforce, acculturate employees into the company, improve cooperation, communication and competencies of individual employees and teams of employees, and improve recruitment, advancement, and retention incentives.

Many corporations have labeled these education and training units or sub-units as universities, and a few of these units have developed academic degree programs that sought and received accreditation. Corporations that have created units designated as universities include American Express, Apple, Disney, First Bank of America, Intel, MasterCard, Motorola, Xerox, McDonalds and Hart Schaeffer & Marx. While most of these do not offer degrees, it is clear that these corporations view learning by employees as important to their future. Thompson [25] suggests that the term corporate university be defined as "an educational institution that offers one or more accredited academic degree programs, and which is a wholly-owned subsidiary of a parent corporation whose core business is not education." This provides a working definition for corporate universities as described in this paper.

Eurich [26] identified at least 18 corporations that in 1985 offered academic degree programs and predicted dramatic increase in the numbers of corporations offering accredited degree programs in the future, possibly numbering in the hundreds. Nash and Hawthorne [27] identified seven additional corporations in 1987, and also predicted dramatic increases for the future. This expansion has not happened to the degree predicted, and accredited degree-granting corporate universities are no more prevalent today than they were in the 1980's. A few of the corporate universities described by Eurich

have become independent of their corporate parent organizations (DeVry from Bell and Howell, for example), and several others have either ceased to offer degree programs or have merged programs with existing universities. Other corporate universities that were projected by Eurich to evolve into degree granting organizations have failed to do so. In fact, Thompson [25] concludes that of the twenty-five universities identified by Eurich and Nash and Hawthorne, only five continue to operate as distinctly corporate universities, and these five have not expanded in academic scope or enrollments to any great degree. Thompson identifies three major reasons for this somewhat surprising outcome, given the optimistic predictions for corporate universities prevalent in the 1980's:

1. a growing tendency of corporations to focus their attention and resources upon their core business and to "outsource" corporate education;
2. the demands of the accreditation process; and
3. a growing willingness of colleges and universities to assist corporations in meeting their educational needs.

These conclusions relate directly to the expansion of options and program expansion noted earlier for extended traditional universities, and also for the dramatic expansion of university-industry partnerships where the strengths of the private sector and the universities are combined to form new structures and relationships.

E. University/Industry Strategic Alliances

Many businesses that are related either to emerging technology and communications applications or to mainline applications such as publishing companies are also testing the water in this new marketplace in a variety of ways. Market opportunities are developing around both content and access, with content being the province of universities and their full-time faculties. But with multiple forms of access increasingly important and with no one technology or mode of access dominating the market, companies with technologies that support learning that can be independent of time, location, and distance are finding the marketplace attractive.

Partnerships and strategic alliances are also developing between and among organizations that capture each organization's primary strengths. Increasingly, these partnerships marry universities and for-profit organizations in ways that force contact and interaction between very different cultures, goals, and operating principles and assumptions. One potential benefit of this interaction is the opportunity for both organizations to acquire much needed information and knowledge from the other, and also to change some of the unexamined practices that may be inhibiting the organization from developing a successful strategy in a changed marketplace. Another view offered by Sir Douglas Hague [28] is that universities must develop partnerships in order to survive the onslaught of competition.

> To avoid being driven out of activities which they have imagined their own by right, the universities will have to make substantial changes in what they do and how they do it. Where they find that difficult, one solution will be to form alliances with the interlopers. Increasingly, the choice will be alliance or annihilation.

Table 4 provides a comparison of characteristics and assumptions related to both corporate universities and alliances between universities and corporations that are becoming increasingly prevalent.

Input	Extended traditional universities	For-Profit adult-centered universities	Corporate universities	University/ industry strategic alliance
Philosophy	Campus goes to students	Campus and non-campus philosophy	Campus and non-campus philosophy	Campus goes to students
Mission	Externally focused, degree completion and workforce development	Almost exclusively workforce focused	Exclusively workforce focused on corporation needs	Externally focused, degree completion and workforce development
Funding	Largely self-sustaining and market driven	Market driven, workforce focused, and profit driven	Funded by corporation-- centrally or by department assessment	Market driven, workforce focused, and entrepreneurial but not necessarily profit driven
Curricula	More flexible curriculum content for workforce competence and development	Focused on workplace needs; adult oriented	Build corporate citizenship and employee skills	Adult workforce competence and development
Instruction	Great variety of methods and use of student experience	Methods typically standardized across locations	Methods typically standardized across locations	Typically custom designed for market; use of instructional design teams
Faculty	Great use of adjuncts with professional experience	Usually staffed with part-time faculty with professional experience	Usually staffed with part-time faculty with professional experience	Combination of faculty with special expertise and practicing professionals
Students	Life and work experience is significant factor in admission	Life and work experience is significant factor in admission	Generally required to be employed by corporation	Targeted groups of students, usually employed adults
Library	Access to specific documents and resources appropriate to program	Access to specific documents and resources appropriate to program	Access to specific documents and resources appropriate to program	Access to specific documents and resources appropriate to program
Learning Technology	Both lecture oriented and used to extend access	Both lecture oriented and used to extend access	Technology a method of reducing costs	technology enables crossing boundaries
Productivity Outcomes	Student credit hours and degrees.	Bottom line is profitability	Profitability and contribution to bottom line of corporation	Profitability a primary concern, also innovation
Governance	Board of Trustees	Board of Directors	Directed by Corporation	Limited liability companies-

				contractual arrangements
Accreditation	Institutional by region	Institutional by region	Institutional by region--Many not yet accredited	University brings its accreditation to the alliance

Table 4. Comparison of Corporate Universities, University/Industry Alliances, Extended Traditional Universities and For-Profit Adult-Centered Universities

Partnerships are not just with universities. The private sector is increasingly developing partnerships to deliver educational programs and services that are created cooperatively and collaboratively across two or more organizations. For example, UOL Publishing, a publisher of interactive and on-demand Web-based courseware for the academic and corporate education market, and Course Technology, a publisher of information systems learning materials for the post-secondary education market, have teamed up to assist community colleges, proprietary colleges, extension and continuing education programs in meeting the growing demand for distance learning. The UOL/Course Technology partnership is intended to enable institutions wishing to take advantage of these growing markets to get these courses up and running very quickly and reliably.

Universities are also forming strategic alliances with major companies in fields such as publishing (Addison, Wesley and Longman), communications (Echo Star, Prime Star), entertainment (Disney), and telecommunications (AT&T, GTE). For example, UOL Publishing, Inc and Georgetown University are jointly creating and distributing an interactive online course on the Internet through Georgetown's Virtual Campus. As part of the agreement, UOL and Georgetown will, upon completion of the course, jointly own the 10-module, 22-hour course in International Business for Georgetown's School of Business. However, UOL will exclusively own all online distribution rights of the Online Course. The Online Course will be made available to continuing education students worldwide who are interested in enhancing their knowledge, skills and abilities in international business management, marketing and finance. Upon completion of the Online Course the students will receive a Certificate of Completion from Georgetown University. IBM has developed its global campus program, a partnership program designed to help colleges and universities use computer networks to redesign learning, teaching, and administrative functions.

As with the Georgetown/UOL Publishing example, the traditional university brings content and faculty to the enterprise, and the company contributes technology, marketing, packaging, and business knowledge and thinking. Whether these alliances will work is still to be discovered, but new contracts, limited liability companies, and other approaches are being organized every day.

A growing number of corporations are also establishing strategic partnerships with colleges and universities to jointly develop degree programs tailored to meet their specific corporate needs[29]. Thompson [25] outlines AT&T's activities in conjunction with a number of universities as an example, detailing relationships with universities such as Penn State, Indiana University, University of Wisconsin, George Washington School of Business and Public Management, Virginia Tech, University of Rhode Island, Georgia Institute of Technology, Arizona State University, Rutgers, Columbia University, the Wharton School of Business, and the University of Phoenix.

F. Degree/Certification Competency-Based Organizations

Organizations are also emerging to take advantage of recent changes in the labor market brought about by the increasing pace of change, especially in technology areas. With learning a requirement to stay current, and with workers changing both careers and employers more often than ever before, individuals need to certify and re-certify their competencies on a regular basis. In the professions, this has become a requirement known as mandatory continuing professional education. In information technology, the

categories of certification include various network certifications, software competencies, and system capabilities. Mechanisms for ensuring that individuals have requisite knowledge, abilities, and experiences are being developed in many professional fields, and it is inevitable that these approaches would be applied to higher education.

Whether mandated by law or by the marketplace, individuals, their current and prospective employers, and the public rely on certification to document an individual's knowledge and his or her ability to apply knowledge in real situations. For-profit companies have developed around the need for certification, primarily in the area of corporate training, and new nonprofit organizations are developing with certification and competency-based learning as major products. Certifying learning and knowledge through assessment appears to be a growth opportunity, one that existing higher education organizations have little experience or infrastructure to develop and have largely ignored. There appears to be a growth opportunity for existing or new organizations that focus upon measuring student achievement. However, these measurements will increasingly need to reflect and measure abilities to apply content to real situations as well as to gauge skills more difficult to measure such as synthesis and application, problem-solving, teamwork, and creativity.

An example of an organization set up for this purpose is Sylvan Prometric, a worldwide for-profit distribution network for computer-based testing services for academic admissions and professional licensure/certification. The challenge offered by organizations such as these is captured by Olcott [19], who suggests:

> Particularly if colleges and universities are to be competitive in the marketplace, future models of financing must be reconstructed to recognize diverse sources of learning (outside the traditional academic environment) that are not defined by FTE (full time equivalent staff), credit hour, or clock hour restrictions. A competency-based approach strikes at the heart of traditional funding structures in higher education. For example, legislative appropriations are tied to FTE formulas while vocational funding is defined in terms of student clock hours.

Certification assumes that people need to be able to demonstrate knowledge and mastery, whether acquired through life experiences, self-directed learning, employer-based learning, or university classes. Especially in information technology areas, the need for certification has grown dramatically as technology shifts rapidly and on the job experience becomes a more widely accepted method of acquiring knowledge and skills.

One example of certification applied to higher education is credit for proficiency based on life experience awarded by many institutions as part of their academic degree programs. Such credit is awarded for experiences and knowledge gained on the job and in other ways that can be demonstrated through testing, portfolio assessment, and other evaluation mechanisms. Credit earned can then be applied toward certification or toward a degree, usually in limited numbers. This approach is, however, very different from the model of a degree-granting institution that awards the degree based upon assessment of the student's mastery of core skills and competencies and demonstrated critical knowledge.

New York's Regents College is an example of an institution offering a complete baccalaureate degree program by examination. Regents College has no physical campus, and teaches no courses. Students engage in a variety of guided activities in preparation for examinations that are intended to measure the knowledge necessary to be awarded a degree. Upon passing the appropriate exams, regardless of how the student developed his or her knowledge base, the student is awarded a New York Regent's degree. A standard for graduation supplants a standard for admission.

Another example of an organization that intends to offer a competency-based certification degree is Western Governors University. Formed by the governors of 13 western states in 1996, WGU intends to define the skills and competencies of particular degree programs and award an accredited degree program to students who demonstrate competency. Unlike the examination model of Regents College, competency may be judged through a variety of mechanisms, including completion of coursework from traditional universities, portfolio assessments, examination, and evaluation of workplace experience. Competency necessary for the degree will be defined by WGU using faculty specialists who will develop the degree program assessment process. Critical to the success of an organization such as WGU is an advising and assessment process that will guide students in a very personal and tailored way to appropriate learning resources, materials, and institutions, thereby enabling the student to take the shortest and least costly path to demonstrating competencies required for the degree.

Input	Characteristics of traditional residential universities	Characteristics of degree/certification competency-based organizations
Philosophy	Students come to campus	No physical campus
Mission	Mission defined by level of instruction	Externally and market focused
Funding	$ per full-time student	Intended to be self-sustaining and market driven
Curricula	Relatively fixed comprehensive curriculum	Curriculum is defined by competencies and knowledge, not courses offered
Instruction	Most courses are lecture-based	Emphasizes student independent learning and initiative
Faculty	Primarily full-time faculty; academic preparation and credentials	No full-time teaching faculty advising and support services are assumed by professional advisors
Students	Selectivity at admission	Life and work experience is major factor in admission--graduation standards more important than admissions standards
Library	Volumes in library	No library---access to materials through cooperative relationships with other institutions
Learning Technology	Enhance lecture-oriented instruction	Access to information about courses and programs provided using technology--technology important in providing the maximum access to learning resources
Physical Facilities	Extensive physical plant	No physical plant
Productivity Outcomes	Student credit hours and degrees.	Student assessments, competencies acquired, degrees awarded
Governance	Board of Trustees	Varies, from administrative board to consortial representative board
Accreditation	Institutional by region; individual programs or disciplines are also accredited	Institutional by region, although Western Governors University is seeking accreditation from four regional accreditation agencies in one process

Table 5. Comparison of Degree/Certification Competency-Based Organizations With Traditional Universities

As noted in Table 5, accreditation plays a vital role in establishing the long-term viability of all of these models. Accreditation is generally concerned with measuring traditional inputs to instruction, as earlier

discussed. This approach emanates from traditional universities, and institutional accreditation processes now in place in the United States are geared to assessing the attributes of traditional residential universities. Because all of the models discussed in this paper differ in fundamental ways from traditional institutions, as earlier discussed, and because universities are increasingly offering programs internationally, regional accrediting associations are under increasing pressure to change the way in which they accredit institutions, and the criteria they use to establish eligibility for accreditation. An excellent example of this major challenge is the establishment of the Western Governors University. Western Governors University is based upon measuring student learning outcomes in very personal and direct ways, and its quality must be assessed upon how well it accomplishes this goal. WGU also intends to serve students across a wide geographic base. These characteristics, among others, challenge the traditional regional institutional accreditation process. The response of the accrediting associations has been, in the case of Western Governors University, to convene a cross-regional accreditation team to develop guidelines for evaluating and assessing this new institution.

It should also be noted that the models framed by this paper do not capture all aspects of every institutional example. There are many variations, and they are organized in increasingly diverse ways. Of particular note are the numbers of universities that intend or are established to capture a global rather than a regional or national market for university education.

G. Global Multinational Universities

The marketplace for learning is becoming global [30]. With new technologies, neither language nor distance is a barrier to access, although cultural norms and patterns are among the formidable obstacles to learning across political and cultural boundaries.

There are currently few examples of universities that are truly global and multinational in character, although there are hints of what such a program might look like. San Diego based National University has developed a "global MBA," offered online, that is available in Argentina, Turkey, Mexico, Ecuador, and Portugal. The program establishes linkages with local host institutions; these institutions provide faculty members and services for enrolled students on a contractual basis. Other universities are attempting to expand from a national to an international base of operation.

Presidio World College for Sustainable Development, based in San Francisco, is a new university that has as its goal creating learning opportunities for people worldwide to learn about sustainable development.

Athena University is a virtual online university established in 1994 to offer online education. Operated by Virtual Online Services International, it has entered into a partnership with the Groupe Ecole Superieure de Commerce of Pau, France, to offer an international MBA. ESC-Pau is a private business school and a member of the Conference de Grande Ecoles in France, a group of elite private business and technical schools with rigorous admission requirements. Their graduates are placed in management and administrative positions in international corporations around the world. The emphasis of the MBA program will be the integration of technology and management strategies. The stated goals are to involve content experts from around the world as instructors, offering a global student population access to global best practices.

The Global (electronic) University was announced in 1992 as an institution that would begin as a global university. Its founder, Takeshi Utsumi, stated its goals as:

> Global (electronic) University (GU) (trademark symbol) consortium, a divisional activity
> of GLOSAS/USA, seeks to improve the quality and availability of international
> educational exchange through the use of telecommunication and information

technologies. GU's main activity is to achieve global electronic education across national boundaries by developing a cooperative infrastructure, so as to enlarge and expand the present exchange of educational courses into a worldwide system. GU will provide under-served people of the developing countries with access to the educational excellence available from all the world's finest sources. Students could access the sources with a far greater variety of educational philosophies, courses and instructional styles than they could ever encounter on a single campus [31]. The Institute for Global Learning is an educational undertaking of The Laurasian Institution. The mission of the Institute for Global Learning is the development and administration of educational programs that result in participants who understand the cultural foundations of economic, political, and social policy and are competent in dealing with and among diverse cultures. The Institute for Global Learning offers courses of study especially appropriate for individuals interested in careers related to international business and public service.

Other educational programs of The Laurasian Institution include:

Providing intensive training to business people engaged in international management and marketing;

Offering information and advice to business and other adult travelers on cultural and professional aspects of particular destinations;

Language training, cross-cultural consulting, policy research, and other services provided through Global Resource Integrators, a not-for-profit membership organization consisting of The Laurasian Institution, The Monterey Center, and Global Education Systems [32].

UOL Publishing, Inc. and Global One, the international joint venture of Deutsche Telekom, France Telecom and Sprint, have formed the Global One Virtual Campus. The Virtual Campus will offer Web-based training for Global One locations in Germany and Virginia and will be expanded to include employees located in the Pacific Rim. The Global One Virtual Campus will initially offer access to approximately 30 courses from UOL's content library. Courses in telecommunications and management will be made available via Global One's worldwide infrastructure of over 1,200 points of presence in more than 65 countries.

Another example of transnational organization is the Global Alliance for Transnational Education (GATE) formed in 1996. GATE's purpose is to be a source of information about educational programs and certifications worldwide for corporate human resource professionals and higher education officers and students. Its purpose is to maximize information and assure quality in a rapidly globalizing education and human resource market. GATE's programs and services are designed to:

Explore current issues companies face in international hiring and universities face in international admissions;

Network across national borders with other corporations and educational associations and institutions;

Access global information on educational systems, institutions and transnational educational offerings; and

Develop principles of good practice and recognition for quality international education and training.

While GATE does not offer programs, it was formed in recognition that the number of educational programs offered on a worldwide basis is about to explode, and that some mechanism for global information sharing and quality standards needed to be established. According to GATE literature, there is a need for the organization because:

> The global marketplace and new technologies are contributing to the rapid globalization of higher education. Today's business environment draws its professional work force from all corners of the globe. Human resource development divisions of multi-national corporations face the increasing challenge of evaluating courses and degrees from other countries when identifying personnel. Further, higher education is no longer provided solely within national borders. Provided both by the higher education and corporate sectors, transnational education can be found in multiple forms, provided both electronically and through traditional instruction and training programs. Issues of quality, purpose and responsibility abound in this new borderless educational arena and the time is ripe for an international alliance of business, higher education and government dedicated to principled advocacy for transnational educational programs [33].

GATE represents an early pioneering effort to develop international standards for quality that recognize that higher education is no longer a local or regional or even national enterprise, and to promote the use of technology in expanding global access. The organization may be the foundation for a new form of institutional assessment and accreditation on a global basis, or it may be no more than a clearinghouse for globally accessible higher education.

While there are no concrete examples of fully operating global universities that have been established purposefully to operate in a global context, the examples offered demonstrate some future possibilities. It is conceivable that while there are no good models currently available, all of the models described in this paper are headed in this direction, much as prospectors for gold looking for the mother lode.

IV. CONCLUSION

This paper has presented and analyzed characteristics of seven emerging models for higher education in the future. The models were derived from analyzing trends, characteristics and examples of emerging organizational practice. They include:

- A. Extended traditional universities
- B. For-profit adult-centered universities
- C. Distance education/technology-based universities
- D. Corporate universities
- E. University/industry strategic alliances
- F. Degree/certification competency-based universities
- G. Global multinational universities

One model, distance education/technology-based universities, was further analyzed according to the type of technology employed and the resulting unique organizational characteristics. The oldest form of these universities is based upon correspondence and mail delivery. The basic element of this form is a student interacting with a professor at a distance. The second form involves extension of a traditional face to face classroom environment via electronic technologies so that traditional classroom interactions between and among students and their professor are simulated to the maximum degree possible. A recent movement

toward online asynchronous learning via the Web and greater use of computer conferencing systems represents the third technology-based approach. These systems permit students to interact with each other and their professor as well as access a rapidly growing set of educational resources available via the Web.

Each of the models and examples of these models presented in this paper is designed to create a competitive advantage in a rapidly changing and growing marketplace. With rapidly developing learning technologies creating new possibilities for organizing learning for adults, these models are both competing with and causing change in the traditional residential model of higher education. Benefits of this new competitive environment include removing barriers to existing educational programs, responding more effectively and quickly to emerging educational needs, improving educational quality, and achieving long-term cost efficiencies. Competitive advantages sought by universities who are experimenting with new models include responsiveness, access, convenience, and quality at a reduced cost for students.

In such an environment, several trends will shape the future.

- The barriers to accessing learning opportunities are falling dramatically because of improved learning technologies.

- The number of providers of and approaches to education and training will continue to grow dramatically as access improves and as demand for lifelong learning increases globally.

- Universities of all types will increasingly focus on responsiveness to learner needs and desires such as convenience, timing, engagement, application of knowledge to the workplace, and learning by doing.

- Instead of simply measuring traditional inputs to the instructional process, universities will be forced by the increasingly competitive and global marketplace for learning to develop new measures of institutional and program quality and responsiveness.

- The potential reach for all educational institutions in a digital economy is global.

As leaders of universities and organizations consider and evaluate strategies for gaining additional advantage in this new educational marketplace, the following concepts are key to further experimentation and development.

A. Ambiguous boundaries
The clarity of boundaries between organizational models is likely to diminish even further. This blurring of boundaries is an inevitable outcome of greater communication and interaction made possible by increasingly powerful technologies. Traditional universities will begin to look more like online universities, and they will increasingly operate more like businesses. What is "on-campus" and what is not will be less and less apparent, and less and less an issue for students and the faculty.

B. Interdisciplinary programs
As learning becomes more connected with personal and professional experiences in all of the models, learning and instruction will become increasingly interdisciplinary. Academic departments will be encouraged administratively and driven economically to reformat and reorganize courses, programs, and structures to respond to increasingly sophisticated and market-knowledgeable students. Technology support units that in traditional universities have been concerned only with improvements in on-campus

instruction will find that their work intersects with continuing education units whose role has been to extend access to programs through use of technology.

C. Student support services
In all organizational models, student support services such as admissions, advising, registration, and placement will focus more on helping the university and its programs reach out to serve students where they are rather than centralizing services in a single location. These direct and immediate contacts with students will become increasingly central to organizational and educational quality. And institutions will increasingly focus on helping students to develop the skills necessary to be successful in today's economy, which values the ability to work in teams, to develop creative approaches to problem-solving, and to learn constantly. In this sense, universities will be more and more concerned with ensuring that students know how to learn and to apply what they learn to real situations, and less concerned with measuring learning in abstract and relatively unconnected assessment processes such as content examinations and multiple-choice tests.

D. Bureaucracy and assumptions regarding change
Traditional universities and national distance education universities will be forced to shed bureaucratic decision-making processes and past operating assumptions that were more appropriate in a shielded government or industrial environment. These changes will occur in order to compete with aggressive for-profit institutions which will communicate by their success in gaining market share in the adult marketplace the need for adapting curricula, programs, courses, and delivery more quickly. The concept of time to market will become more critical.

E. The need for faculty
All universities will require full-time faculty and staff dedicated to engaging a diversity of learners who will increasingly bring more complex learning needs to universities. For-profit and online universities will especially discover the necessity of having this core team of professional faculty and staff, whether physically located together or across distances, whose members can perform the many complicated tasks necessary to build any new organization focused upon building quality learning experiences for students.

F. Strategic alliances
Universities of all types will seek expanded alliances with each other and with the corporate sector. While demand for learning is growing, and access is improving, competition will increase. This competition will cause universities and corporations alike to focus on their unique programmatic and delivery advantages. Corporate universities will seek to broaden their mission to include certification and degree options for employees, but they will do so through the formation of new strategic alliances with universities. The corporation with hundreds of learning strategic alliances is not difficult to imagine.

G. The impact of technology
Technologies will be utilized in creative ways to further erode the separation of students from each other from their teachers, and from content relevant to the needs and interests of the student. As all of this occurs, the truly global nature of the educational marketplace will become increasingly clear, just as it has become apparent in this decade that the market for higher education is no longer singularly local. It will also become clearer that the impact of technology is not to create mass markets for learning, but to create options that are more and more customized for individual learners in organized patterns of inquiry.

H. Measurement of program quality
Educational programs will be measured more and more on inputs that matter to students and employers. Criteria for accreditation and quality assessment will change to reflect more specific measurements to

learning than those currently used. Haworth and Conrad [34] offer particularly useful criteria for measuring both program and institutional quality in ways that will be valuable to learners who, with better and more accessible information, are becoming more sophisticated consumers. These criteria are shaped around a general theory of engagement between learners and teachers, between students and faculty, and between customers and institutions. Institutional and program accrediting agencies should consider incorporating these measures of quality into their assessment processes and criteria.

I. Achieving Strategic Institutional Advantage

For some universities, the new digital environment suggests focusing resources on just a few unique or particularly outstanding programs and delivering them globally. For others it will mean organizing programs differently to take advantage of a combination of programmatic strengths, and for still others it will mean developing the right partnerships to shore up weaknesses in programs, delivery, service to students, or other areas important to offering quality programs. While opportunities will abound for all, the abundance of opportunities will demand greater focus and clarity about purposes and competitive strengths as organizations compete in a larger more complex marketplace. No institution can afford to ignore this environment, even those who are currently positioned at the top of the higher education pyramid.

Leaders of all institutions and programs, to be effective in this era of digital competition, need a strong rationale and framework for organizational change. This rationale will provide a foundation for organizational adjustments and even transformations necessary to respond to the opportunities and risks presented by increased world-wide demand for learning, advancing learning technologies, and growing competition among multiple providers, all seeking to gain competitive advantage. This rationale can be enhanced by an understanding of organizational change theory and might include such factors as:

- The relationship of universities to social purposes and goals
- Higher education as an open system
- The powerful influence of external factors
- The importance of multiple points of resistance
- Alternative means of achieving similar results
- The complexity of system-wide adjustments
- The role of competition in fostering innovation
- Collaboration and communication as vehicles of change
- Technology as a lever for transformation

It should be apparent from this discussion that the organizational models presented are dynamic, and the boundaries between them are fluid. Clearly, all universities have the potential to become the educational equivalent of global multinational corporations that operate across national boundaries. While traditional campus-based higher education is organized around a physical place, the evolution toward global transnational universities will result in content and delivery mechanisms designed to minimize cultural and geographic barriers to attendance. Universities of all types will have new opportunities to build upon diverse views of the world, of organizations, of opportunities, and of issues and problems. The ultimate result will be the eventual reduction of barriers to cross-national study, just as international trade and competition is removing the barriers to the creation of a global economy.

REFERENCES

1. **Steiner, P.** "On the Internet Nobody Knows You're a Dog." Cartoon. The New Yorker, (Vol.69 (LXIX) no. 20), July 5, 1993, p. 61.
2. **Baldridge, J. and Deal, T.** The Dynamics of Organizational Change in Education. Berkeley, CA: McCutchan Publishing Company, 1983.
3. **Toffler, A.** The Adaptive Corporation. New York: McGraw Hill, 1985.
4. **Lenzner, R. and Johnson, S.** "Seeing Things as They Really Are." An Interview with Peter Drucker. Forbes Magazine, March 10, 1997, pp. 126-127.
5. **Noam, E.** "Will Books Become the Dumb Medium?" Keynote Address to EDUCOM'97, Minneapolis, Minnesota, October 27, 1997 [http://www.group-mind.com/educom/conf/97/noamaddress.html]
6. **Oakley, B**. "Will Universities Survive in the Knowledge Economy?" Interface, IEEE Newsletter, April, 1997.
7. **Davis, S. and Botkin, J.** The Monster under the Bed. New York: Simon and Schuster, 1994.
8. **Sperling, J. and Tucker, R.** For Profit Higher Education. New Brunswick, N.J.: Transaction Publishers, 1997.
9. **Tapscott, D.** The Digital Economy: Promise and Peril in the Age of Networked Intelligence. New York: McGraw-Hill, 1996.
10. **Ghazi, K and Irani, I.** Emerging Trends in the $670 Billion Education Market. New York: Lehman Brothers Education Services, 1997.
11. **Ghazi, K.** The Adult Education Market: A Comprehensive Guide. New York: Lehman Brothers Education Services, 1997.
12. Post-secondary Education Quick Information Survey on Distance Education Courses Offered by Higher Education Institutions. Washington, D.C.: U.S. Department of Education, National Center for Educational Statistics, Table 1, 1995.
13. Primary Research Group. The Survey of Distance Learning Programs in Higher Education. New York: Primary Research Group, 1997, p, 18.
14. See Washington State University. Web Address: [http://www.wsu.edu/vwsu/]
15. **Spanier, G.** "A Conversation With President Spanier." The Penn Stater, September/October 1997.
16. **Spanier, G.** "1997 President's State of the University Address." Penn State University, September 12, 1997. [http://www.psu.edu/ur/state/stateofuniv97.html]
17. "University of Wisconsin System Planning Document." University of Wisconsin System, September, 1997
18. "California State University Institute: Higher Education's Entrepreneurs." California State University Web Address: [http://www.co.calstate.edu/CSUI/info/summary.html]
19. **Olcott, D.** "Renewing the Vision: Past Perspectives and Future Imperatives for Distance Education." The Journal of Continuing Higher Education, Volume 45, Number 3, Fall, 1997, p. 2.
20. See the University of Phoenix. Web Address: [http://www.uophx.edu/uop/_campus.htm]
21. **Keegan, D.** "On defining Distance Education." Distance Education: International Perspectives (Eds. Sewart, D., Keegan, D. and Holmberg, B.). New York: Routledge, Chapman & Hall, Inc., 1988.
22. **Daniel, J. S.** Mega-Universities and Knowledge Media: Technology Strategies for Higher Education. London: Biddles Ltd., 1996.
23. **Keegan, D.** "The Competitive Advantages of Distance Teaching Universities." Open Learning 9, 2, 1994, pp. 9-36.
24. **Hall, J.** Access Through Innovation: New Colleges for New Students. New York: American Council on Education & Macmillan, 1991, pp. 127-141.
25. **Thompson, G.** "Unfulfilled Prophecy: The Evolution of Corporate Colleges." University of Saskatchewan. Publication Forthcoming, 1998, p. 6.
26. **Eurich, N.** Corporate Classrooms : The Learning Business. Princeton, N.J. Princeton University Press, 1985.
27. **Nash, N. and Hawthorne, E.** Formal Recognition of Employer-sponsored Instruction: Conflict and Collegiality in Post-secondary Education. College Station, Tex.: Association for the Study of Higher Education, ERIC Higher Education Report No. 3 (ERIC Document Reproduction Service No. ED 286 437, 1987.
28. **Hague, Sir Douglas.** Beyond Universities: A New Republic of the Intellect. London: Institute of Economic Affairs, 1991.

29. **Meister, J. C.** Corporate Quality Universities: Lessons in Building a World-class Work Force. New York: Irwin, 1994.

30. **Duderstadt, J.** "The Future of the University in an Age of Knowledge." Journal of Asynchronous Learning Networks, Volume 1, Issue 2. August, 1997 [ISSN 1092-8235]. Web Address: [http://www.aln.org/]

31. **Utsumi, T.** "Invitation to Membership of GLOSAS (Global Systems and Simulation Association." Web address: [http://library.fortlewis.edu/~instruct/glosas/invite.htm

32. See the Laurasian Institute Web Address: [http://www.laurasian.org/TLI_home_folder/TLI_educ.html]

33. "GATE Vision: Achieving Worldwide Access to Quality Education and Training." Global Alliance for Training and Education (GATE) Web Address: [http://www.edugate.org/vision.html].

34. **Haworth, J, and Conrad, C.** Emblems of Quality: Developing and Sustaining High Quality Programs. Boston: Allyn and Bacon, 1997

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From 1993 to 1997, Dr. Hanna served as Chancellor of the University of Wisconsin-Extension. As Chancellor, his responsibilities included leadership of programs in extension, continuing education, distance education, and public television and radio for the University of Wisconsin System, which is comprised of 13 four-year campuses and 13 two-year centers. As Chancellor, he provided leadership to a number of distance education initiatives within Wisconsin. Areas of development and leadership included implementation of a statewide compressed video system connecting all four year University of Wisconsin campuses, conceptual development and the achievement of state funding for the Pyle Center for Distance Education, and expanded use of the internet and web for instructional outreach.

Prior to joining the University of Wisconsin-Extension, Dr. Hanna was Associate Vice-Provost for Extended University Services at Washington State University and also Professor of Adult and Continuing Education. From 1983 to 1993, he provided leadership to distance education and telecommunications programs and systems designed to extend WSU programs to citizens of the State of Washington. From 1979-1983, Don was Head of the Division of Extramural Courses and Assistant Professor of Adult and Continuing Education at the University of Illinois at Urbana-Champaign.

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Dr. Hanna has traveled extensively in the developing world. He has served as a consultant both within the US and internationally to many organizations involved in the use of telecommunications in education. He and his wife, Karna, served in the Teacher Corps in Lackawanna, NY, and in the Peace Corps in Afghanistan, and their two children, Jason and Betsy, are both currently in college.