The aim of the Journal of Asynchronous Learning Networks is to describe original work in asynchronous learning networks (ALN), including experimental results. Our mission is to provide practitioners in online education with knowledge about the very best research in online learning. Papers emphasizing results, backed by data are the norm. Occasionally, papers reviewing broad areas are published, including critical reviews of thematic areas. Papers useful to administrators are welcome. Entire issues are published from time-to-time around single topic or disciplinary areas. The Journal adheres to traditional standards of review and authors are encouraged to provide quantitative data; currently JALN's acceptance rate is 25%. The original objective of the Journal was to establish ALN as a field by publishing articles from authoritative and reliable sources. The Journal is now a major resource for knowledge about online learning.
The purpose of the Sloan Consortium (Sloan-C) is to help learning organizations continually improve the quality, scale, and breadth of their online programs according to their own distinctive missions, so that education will become a part of everyday life, accessible and affordable for anyone, anywhere, at any time, in a wide variety of disciplines.
# Journal of Asynchronous Learning Networks

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For more information about Olin and Babson Colleges, visit www.olin.edu and www.babson.edu.
INSTITUTIONAL TRANSFORMATION:  
INTRODUCTION TO THE SPECIAL ISSUE

Janet C. Moore  
The Sloan Consortium

Is there sufficient motivation for the institution to scale up online education?  
This may involve financial and other considerations, and [we refer] to it as “cost-effectiveness” [1].

ABSTRACT
This special issue of the Journal of Asynchronous Learning Networks focuses on institutional transformation, including insights into business models. This introduction points to additional Sloan-C resources on cost effectiveness and institutional commitment.

KEYWORDS
Institutional Transformation, Institutional Commitment, Institutional Motivation, Business Models, Cost Effectiveness, Scalability

I. INTRODUCTION

This issue of the tenth anniversary volume of the Journal of Asynchronous Learning Networks looks back to the original propositions about institutional commitment that were framed more than a decade ago when asynchronous learning networks (ALNs) showed early promise of transforming higher education by making it more accessible, effective, affordable, and satisfactory. Because Asynchronous Learning Networks (ALNs) “emphasize people-to-people communication combined with traditional and/or information-technology-delivered learning tools” [2], Mayadas observed that “Access to high quality, cohort-style learning, even for special learner segments and narrow specialties, represents a new outcome that is made possible through the three features of ALN approach—asynchronicity, efficiency and geographically distributed cohorts” [3].

ALN promised to:
Reduce costs without reducing quality [delivering] education to anyone, anywhere and at anytime… [and] increase the capability of higher education to reach new markets, both for life-long learners and for learners in industry… increasing productivity and scaling up to permit teaching larger numbers of learners [2].

Yet in 1997, for on-campus programs:
Exploration of new productivity outcomes, is largely absent, partly because there appears to be little motivation to explore outcomes which could impact costs through larger class sizes, improved student retention, and self-pacing, while at the same time improving learning quality [2].
Today, online learning is an expectation in higher education, and it soon will be in K–12 [4, 5]. Online education has grown rapidly and continuously. Nearing 20% of all postsecondary enrollments, online education’s growth rate is ten times the overall growth rate projected for all of higher education; academic leaders believe that online learning quality is already equal to or superior to face-to-face instruction, that its quality is readily assessable, and that students are at least as satisfied learning online as they are face to face; 56% of the nation’s institutions of higher learning report that online education is critical to their long-term strategies [6, 7].

Because greater access to quality higher education is a national imperative, the transformative effects of ALN on institutions are increasingly important. Thus, in 2005, one of the challenges of the annual Sloan summer research workshop was:

How can institutions be transformed best to take advantage of ALN in support of their core missions? What are key enablers of this transformation, including areas such as institutional vision, leadership, business models, and organizational structures?

II. INSTITUTIONAL TRANSFORMATION

This issue includes the responses of three teams who responded to the Sloan summer research challenge on institutional transformation; in addition, six mini-cases that give snapshots of transformation at an array of institutions.

- In “ALN Business Models and the Transformation of Higher Education,” Miller and Schiffman suggest that institutions’ entry into online programming was most likely motivated by these intentions:
  1. to extend access to degree programs to new off-campus students or
  2. to improve the quality of teaching for existing students on campus [8]

Whether the initial motivation was for on-campus students or for outreach to new students, ALN has influenced reconsideration of leadership and engagement throughout educational organizations. Miller and Schiffman observe that people at all levels in the institution need to work towards continuous innovation: “The ultimate transformation of higher education will be determined by how well institutions mainstream online learning into their curricula, into their business practices, and into the broad academic culture of their institutions” [8].

- In “Online Learning: New Models for Leadership And Organization in Higher Education,” Otte and Benke summarize how leadership roles and integrative processes are being affected by ALN’s “rhizome-like reach into all aspects of institutions of higher education;” they provide provocative questions for examining “interfaces between online and blended learning, profit-centers and centralized programs, part- and full-time faculty, and even exchanges beyond departments and institutional boundaries” [9].

- In “The Times They Are A-Changing,” Scarafiotti and Cleveland-Innes survey sweeping changes in demographics. Giving fundamentals for student access and success, they emphasize strategic planning based on mission distinctiveness [10].

- In “Cases of Institutional Transformation,” Lorenzo interviews people at six institutions—The Pennsylvania State University, University of Texas TeleCampus, Rio Salado College, The City University of New York, Athabasca University, and Empire State College—and provides snapshots of surprisingly different ways ALN has transformed practice [11].
III. BUSINESS MODELS

Responding to the “dearth of detailed information on effective business models, business strategies and effective practices on which to build sustainable online education programs,” Vignare, Geith and Schiffman share a survey designed to determine the effectiveness of various models [12]. They find that 3 models predominate: “(1) Independent self-funded college, (2) department or school within the university which is self-funded, and (3) department or school within the university which is overhead funded” [12]. Examining student services, curriculum planning and design, and business decisions, the survey finds that “some of the biggest challenges were faculty, staffing, investment, constantly changing environments, managing quality, and support for students and faculty” [12].

In “Business Models for Online Education,” Lorenzo reports on interviews with nine institutions—Colorado State University, Dallas County Community College District (DCCCD), Duquesne University, Georgia Institute of Technology, University of Central Florida, The University of Illinois at Springfield, University of Massachusetts Lowell, University of Michigan, and University of Georgia [13]. Each of these is building innovative environments.

IV. ADDITIONAL SLOAN-C RESOURCES ON COST EFFECTIVENESS AND INSTITUTIONAL COMMITMENT

By some estimates more than 80% of the eligible U.S. population lacks college degrees [14]. To make “learning outside of the classroom… what it ought to be, an ongoing part of ordinary life” [15], Sloan-C’s goal of greater access through ALN means expanding the quality, scale and breadth of higher education.

Institutional commitment and cost effectiveness for providers and for learners are significant components of Sloan-C’s quality framework [16] and of effective practices that Sloan-C members have contributed [17,18]. Bishop’s “Research Highlights: Cost Effectiveness of Online Education” [19] provides especially useful metrics for containing, reducing and avoiding expenditures in money, time, and effort.

The Sloan-C quality framework calls for: models tuned to institutional mission; tuition and fees that reflect the cost of delivery and services; continuous testing of strategies and policies, including policies for intellectual property, partnerships and resource sharing to reduce costs; and scaling educational programs to accommodate capacity enrollment as unique institutional missions define it [20].

A. Mission

Not only the missions of individual institutions, but also the mission of higher education itself is changing to create “ubiquitous cultures of learning… in which educational opportunities become pervasive through the use of information technology” [21]. “We need a new paradigm for delivering [education] to even broader segments of our society. Just as with other resources such as food, energy, and transportation that soon became necessities of modern life and therefore the responsibility of a society, today higher education itself has become a similar need” [20].

Envisioning a new paradigm, the ‘meta university’ of the future, Graves observes that “the invisible hand of educational leadership will be required to ensure that technology-enabled innovation and competition create new national educational ‘wealth’ rather than costly chaos within the higher education community” [22]. Because institutional transformation requires simultaneously top-down commitment, strategic planning, partnership building, and bottom-up innovation, Graves asserts that merely bolting technology
onto the classroom lecture might enhance learning but would be prohibitively expensive. A better approach would be to move away from the lecture and towards more faculty-supported and self-directed, active learning. Such an approach would require rethinking, disintermediating and disaggregating traditional practices including various faculty roles, instruction, assessment, instructional and curricular costs, and general education and the majors, “Collabotition—collaboration and competition—among institutions will have to include changes in policies that govern the inter-institutional exchange of academic and financial credits and a host of other business practices that are inimical to the success of distributed education” [21].

“Clearly, all universities have the potential to become the educational equivalent of global multinational corporations that operate across national boundaries,” says Hanna in his 1998 study, “Higher Education in an Era of Digital Competition: Emerging Organizational Models.” Hanna compares traditional and emerging models and missions for higher education, finding 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… challenging traditional residential universities to change more quickly and dynamically” [23].

Recognizing that reputation is “embedded in brands—the name of the institution is readily recognized and it is easy to associate quality level to that name” [24], schools envision the effects of change, making it part of their institutional missions. Many schools that have done so have experienced annual enrollment growth rates of 25–40%. Here are just a few examples of schools that have integrated online education into their missions. A world leader in online education, with significant attention to student services and intellectual property [25], University of Maryland University College (UMUC) has more than 144,000 online enrollments; its mission is: “The University in its entirety has but one focus—the educational needs of the nontraditional student” [26]. Beginning in 1995 with 119 enrollments on two campuses, SUNY Learning Network (SLN) has become an integrated instructional method on all 64 of its campuses, now offering more than 4300 courses with 2000 faculty and more than 106,000 students worldwide. The primary goals of SLN are to “bring SUNY’s diverse and high-quality instructional programs within the reach of learners everywhere, and to be the best provider of asynchronous instruction for learners in New York State and beyond” [27]. Based on its history of distance education since 1892, with the advent of ALN, the Pennsylvania State University decided to create its 25th campus and named it World Campus with a mission “to connect learner needs with Penn State resources through a variety of program delivery technologies and methods to help individuals transform their lives through education” [28]. All five University of Massachusetts campuses participate in UMassOnline which began in 2001 with a mission to “to meet the online educational needs of people locally, nationally, and internationally by offering accredited educational programs via interactive, Internet-based learning systems” [29]. With more than 105,000 enrollments, Illinois Virtual Campus (IVC), 72 public and private colleges and universities in Illinois “seeks to provide residents of Illinois with easy access to all of the online offerings of Illinois colleges and universities, to provide high quality support services for all online students in Illinois, and to provide state-wide leadership for the development of quality, comprehensive, and cost-effective online higher education offerings to meet the needs of Illinois citizens” [30]. With more than 80,000 enrollments in its first five years, eArmyU’s mission is to: “Increase retention by allowing Soldiers to earn credits, degrees and certificates at low or no cost to them while they serve on active duty, and develop educated, technology-savvy Soldiers who will succeed in the missions and on the battlefields of the 21st century;” already one-third of all Army voluntary education is online [31].

At Rio Salado, where enrollments grew from 10% of total enrollments in 1995 to 48% in 2002, the core ideology is illustrated by its Vision, Pride Factors, and Core Values:

Vision: Through living our values, Rio Salado College creates a climate of high expectations for
the success of our students, customers and employees.

Pride Factors: We take great pride in providing programs and services that are characterized by:
quality, convenience, timeliness, and accuracy.

Core Values: We are unalterably committed to demonstrating the following core organizational
values: Learning, customer focus, innovation, assessment/continuous improvement, teamwork,
professionalism, and diversity [32].

Rio Salado’s mission is:

As an institution of higher education placing high value on student learning, Rio Salado College
creates convenient, high-quality learning opportunities for diverse populations. We specialize in
customized, unique programs and partnerships, accelerated formats and distance delivery. In all
that we do, we pursue continuous improvement and innovation, and we challenge the limits of
tradition [32].

B. Strategy, Policy

Costs for online education—development, delivery, administration—affect all the stakeholders: students,
parents, faculty, institutional leaders and national policy makers. Thus, Hislop recommends that “we
should approach [cost] studies more from the perspective of economics or policy formation than thinking
of them as simple accounting exercises” [33]. Indeed, strategic planning and policy making must reflect
the diverse contexts and aims of higher education. Surveying “The Costs and Costing of Networked
Learning” and taking multiple perspectives into account, Rumble identifies approaches to costing and
details a range of cost comparisons [34]. In another multi-perspectival model—the ACTIONS model:
access, costs, teaching functions, interaction, organizational issues, novelty, speed—Reid details how
organizations can create system-wide, comprehensive approaches to their selection of IT resources for
“scalability, interoperability, consistency and flexibility” [35]. Moonen sees such strategies as efficiencies
that optimize costs and quality effects: “An educational system is said to be ‘efficient’ when an optimum
balance is found between minimizing the costs and maximizing the effects/quality” [36].

Keeton finds that an “institutional environment that supports and encourages inquiry” is the most highly
regarded indicator of quality among faculty [37], and others examine institutional resistance to change.
Citing Jaffee [38], Harris points out that:

Institutions of higher education are social organizations characterized by "traditions, cultures,
norms, and institutional missions." These are all reflected in the decision-making processes of the
university, which places great power in the hands of the faculty and distributes the making of
policy decisions across the full spectrum of organizational units. Policy is set by the university,
by the school or college, by the academic department, and by the individual instructor. Worse yet,
policy is often set at one level, interpreted at another level, and executed and monitored at a third.
Some of the most staunchly defended policies are de facto, a result of custom and tradition rather
than purposeful administration. It should come as no surprise that far reaching policy changes are
hard to come by in the university [39].

Thus, Jaffee calls for examining “the prevailing academic culture and the widely institutionalized value
placed on classroom-based teaching and learning” [38].

Schools that have reported on their organizational and cost structures reveal a rich diversity of cultures,
values, and innovations. At the University of Illinois, where the fee structure for online courses is
identical to other scheduling options, cost analysis includes benefits such as increased income potential,
job fulfillment for technically proficient graduates, and faculty training [40]. The University of Illinois at Urbana-Champaign continuously monitors “vital signs including learning effectiveness, market demand, student satisfaction, faculty satisfaction, retention, profit and growth” [41]. UMUC discovered ingredients that contribute to an ideal cohort size of 25, noting that “cost examinations should consider the beneficial spillover effects of online education, such as renewed interest in pedagogy and innovation, to the entire institution” [42]; UMUC explicitly links cost measures and strategies with quality indicators for student and faculty support, curriculum development and delivery, and evaluation and assessment [43]. At the State University of New York, 64 campuses benefit from cost effective central faculty training and local faculty support centers [44]; a key part of SUNY’s strategy is ongoing research into faculty and student satisfaction. Pace University’s program, the National Coalition for Telecommunications Education and Learning (NACTEL), employs partnerships with industry and service organizations and meets short-term and long-term financial goals using continuous, embedded assessment [45]. At Brigham Young University (BYU), where on-campus enrollments are fixed, a cost effective goal is to use technology to deliver BYU degrees by substituting capital for labor, decreasing costs per learner by 40% [46]. The Rochester Institute of Technology emphasizes educational relationship management using profiling and tracking systems not usually found on campuses [47]. At Drexel University where cost analyses compare hidden face to face costs such as physical plant and equipment depreciation and replacement with costs of online delivery such as faculty incentives, support staff, and technology, a key consideration is the valuation of student time [48]. As part of its strategy, Drexel University makes online teaching a regular part of faculty workload [49]. At the Pennsylvania State University, a full range of student services is provided online [50, 51]; faculty are rewarded for online teaching and innovation [52]; ongoing research is conducted to conserve faculty time [53]. A balanced range of programs minimizes fixed costs on individual programs; value based pricing responds to market demand; and “outsourcing, continuous quality improvement, streamlining marketing, and student services relationships help achieve the goal, which is capacity enrollment” [54].

C. Partnerships and Resource Sharing

Sharing resources and creating partnerships “maximizes available resources [leveraging] costs and benefits to the institution” [19]. Opportunities for partnerships and resource sharing abound. Some examples are consortia and multi-school partnerships [31, 55], libraries [56], general education, and profession- and industry-specific educational course sharing and evaluation [45, 57, 58, 59, 60], open source programs and voluntary groups for sharing assessment and courses [61], and partnerships among institutions and businesses [62]. To help faculty engage in cross-institutional collaboration, McCurdy and Schroeder provide a webliography of useful resources including opportunities for inter-institutional partnerships [63].

Within institutions, ALN enables more efficient use of space and other resources, as exemplified in studies of courses in chemistry [64, 65], electronics [66], engineering [67], statistics [68], pharmaceutical sciences [69], and in circuit analysis, economics, microbiology, and Spanish [65]. In each of these cases, not only were more students served at lower cost, but gains in learning were achieved.

D. Scalability

In 1982, Turoff predicted that, without reducing quality, virtual universities could be built that would cost less than a single physical classroom. Virtual universities could reach students anywhere using constructivist, cohort-based instruction with highly interactive technologies that would manage academic communications and administrative functions [70]. Grave concurs that schools could do more with less by:

- redesigning individual course sections to increase learning and convenience,
• redesigning common courses to decrease costs and increase learning outcomes, and
• redesigning program delivery to participate in flex markets [71].

Today, with a billion worldwide internet users, and another billion expected within the next decade [72], the demand for education is limitless [73]. Especially for audiences for whom education was not feasible before now, ALN can improve success rates using proven pedagogies with significant cost reductions, by fostering more flexible schedules and greater sense of community and engagement, and by sensitivity to language and culture [74].

V. CONCLUSION

As many have shown, asynchronous learning networks are leading the transformation of higher education. Of value to students, faculty, the institution, and society, ALN makes it possible for far more people to obtain college degrees:

College graduates are more likely to vote, to have regular health care, to raise healthier children, to volunteer, and to raise children with higher measures of educational achievement. Overall, there is a strong relationship between having a college degree and measures of health, community involvement, and cultural participation, all of which have value to society. Society also benefits directly from the monetary effects of higher education, since college graduates earn and spend more, and pay more taxes than those without college degrees [75].

When higher education “becomes what it ought to be” [15]—not only our institutions—but also the quality of everyday life will be transformed.

VI. ABOUT THE AUTHOR

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VII. REFERENCES


ALN BUSINESS MODELS AND THE TRANSFORMATION OF HIGHER EDUCATION

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ABSTRACT
The ways institutions have structured their initial innovation with online learning vary greatly. Initial business model decisions present different challenges in terms of how institutions will integrate online learning. This paper looks at several common business models and the opportunities and challenges that each presents to institutions that want to fully integrate online learning.

KEYWORDS
Institutional Transformation, Access, Quality

I. THE IMPACT OF STARTING POINTS
Most institutions began their online learning programs with one of two goals in mind: (1) to extend access to degree programs to new off-campus students or (2) to improve the quality of teaching for existing students on campus. Initial emphasis on access or quality typically drove early decisions about organization and funding.

If access was the primary goal, institutions tended to position their online learning initiative within their continuing education or distance education programs. Examples from early Sloan Foundation projects include New York University, where the program operated within NYU’s School of Continuing Studies; Penn State’s World Campus, which is part of Penn State’s Outreach organization; and the University of Maryland University College, which stands as a separate adult education institution in the University System of Maryland. While there are many different models for continuing and distance education among U.S. institutions and state systems, most share one common feature: they are organized as cost centers with the expectation that they recover costs of operations through new revenue generated by tuition and contracts. They also tend to report through separate university administrators rather than through academic deans.

If quality for on-campus students was the primary initial goal, institutions tended to position the online learning initiative within the Provost’s office or in individual academic units. Examples include the University of Illinois, where the initiative tended to be more integrated into the traditional academic structure of the institution; programs were led by the Provost’s office or by faculty in individual academic units. Cost recovery was achieved through the normal academic budget.

Regardless of where the institution started, online learning initiatives have tended to cross barriers.
Traditional students have wanted to enroll in programs designed for external audiences; academic units have seen opportunities to extend campus-based online courses to off-campus audiences. The result has been to put pressure on the existing budget model and organizational structure.

### A. Access Models

Institutions have innovated with online learning to extend access because they see an opportunity to generate revenue or because they see online learning as an extension of their social mission. Ideally, the two concerns overlap so that the social mission can be sustained. The two most common business models related to access are the creation of a for-profit subsidiary and the creation of a cost-recovery center (with varying degrees of central subsidy) within a continuing education unit.

1. **For-Profit Subsidiary Model**

   The creation of a for-profit subsidiary within a nonprofit institution (public or private university) is perhaps the model with the highest risk for long-term success in U.S. online learning. Many for-profit subsidiaries have proven not to be sustainable. In some cases, the initial business opportunity was satiated, and the institution did not find additional avenues for growth or the intended market did not materialize. Since for-profit models tended not to be tied to the institution’s core mission, there was little reason for internal investment to sustain the initiative. The for-profit approach presents significant challenges to full institutionalization, due largely to barriers between the for-profit work and the institution’s nonprofit mainstream. For instance, if a faculty member wants to use intellectual property that he/she created in the for-profit unit with the faculty member’s mainstream course—or if the institution wants to mingle external and internal students in a single course, it would need to develop new business processes to bridge the for-profit and nonprofit sides of the institution.

   The leadership challenge for institutionalizing a for-profit subsidiary operation to transform the larger institution is to build bridges between the two business models. Connecting the two models may require internal licensing arrangements and new faculty policies. For example, a for-profit subsidiary may require separate intellectual property agreements with faculty for development of courses. Intellectual property agreements could limit the ability of faculty to integrate online courses into the nonprofit side of the institution. Similarly, the financial divide between a nonprofit institution and its for-profit subsidiary may make it impossible for the institution to mingle students from both sides of the institution into a single course section.

2. **Cost-Recovery Model**

   The cost-recovery model is common among institutions that had a pre-existing commitment to continuing and distance education with an organizational infrastructure that could accommodate an online program. In this model, the online learning unit operates within the administrative structure of the larger institution, but functions as a separate budget center, with the goal of recovering its costs through new tuition revenue generated by new students. The challenge in this environment is to build new budget and administrative processes that allow mainstream students to participate in the continuing/distance education program. For example, most continuing education programs operate well outside the traditional bursar function of their institutions. A significant financial process issue arises when an online program created for external audiences is extended to traditional students. Paying for faculty time and effort (costs of teaching and/or course development) is often another hurdle, as these activities are often not part of a traditional academic department’s teaching load model.
B. Quality Models
Some institutions have used online learning to address quality and cost issues within the institution’s mainstream resident program. In this context, “quality” may relate primarily to instructional issues: the desire to improve interactivity in large lecture sections or to encourage greater levels of student inquiry and knowledge creation in a course. Ensuring curricular coherence across multiple sections of a course may also be seen as a quality issue. Cost issues may relate to reducing the drop-out rate in high-enrolling courses and minimizing the need for duplicate sections of a course.

In these situations, institutional leaders have three primary challenges: (1) how to sustain the cost of online learning within the existing tuition stream; (2) how to move from the limited scope of an innovation (often supported by a grant or contract) to a broader institutional strategy; and (3) how to organize centralized support services for development and delivery so that all academic units have appropriate access to online learning. These challenges speak to broad institutional cultural issues—faculty ownership of their individual course content, for example—on one hand and “backroom” business process issues—the need to reserve funds annually from tuition, research funding and state appropriations income to support the development, maintenance, and assessment of online courses—on the other.

II. LIMITS TO GROWTH
The initial business model provides a starting point for institutions to consider mainstreaming the online learning initiative. Each institution must consciously recognize and select the appropriate model that fits its mission and culture and work to implement that model as effectively and efficiently as possible. Next steps depend on how far along the institution is in developing its capabilities in the area of online education. If an institution has developed significant capabilities, it is time to re-examine core strategies for the institution as a whole, to begin the process of integrating strategies. Conversely, unless an institution has achieved some meaningful level of learning about how online education fits it, higher level integration is premature.

Mintzberg uses the metaphor of the potter who learns by experience what is possible to craft with clay. Experience determines the final form of the object. By analogy, institutional strategy also should emerge as a function of experience; strategy is crafted by hands and minds, not just by pure logic. Strategy must be consistent with the institution’s mission. As long as an institution’s mission for distance education is seen as unconnected with the mission as a whole, transformation is not likely. Equally important, the strategy must be consistent with the institution’s culture; to a great extent, the institution’s experience during the period of initial innovation is a test of cultural acceptance. As Mintzberg noted, “Strategies grow like weeds in a garden. They take root in all kinds of places, wherever people have the capacity to learn (because they are in touch with the situation) and the resources to support that capacity. These strategies become organizational when they become collective, that is, when they proliferate to guide the behavior of the organization at large” [1].

The relevance to educational institutions pursuing online educational initiatives is obvious. The right thing to do at the start is to pursue the Sloan-C 5 pillars of quality [2], within a suitably chosen business model. As some point, however, the institution becomes ready to craft a new strategy, to integrate its capabilities in online education into the strategy of the institution as a whole—or set it aside.

The process of optimizing the online educational subsystem leads to what may be termed “constrained (or local) maxima.” To illustrate, think of fixed pegs and attached ropes. Think of the existing institutional structures (policies, procedures and organization) as fixed pegs. Other pegs represent external structures:
accrediting agencies and political structures. To these pegs are attached a network of ropes representing the people and initiatives of the institution. The pegs are there for a good reason (or at least they were, presumably, at some time): to give the moving ropes a measure of stability. Policies, procedures and organization are artifacts of strategy that guide people and initiatives in alignment with institutional mission. In whatever way the online educational initiative is positioned in an institution, as a separate unit or “virtual” organization [3], its running room is constrained by the fixed pegs of institutional structures. In its quest for continual improvement, then, at some point the institution reaches its limit of stretch. This is a local or constrained maximum.

An example specific to ALN may be useful in understanding this concept. Suppose an institution started online education with access as a primary goal, organized within a continuing education program, and used adjunct and some full-time faculty to deliver courses, paying them on an “overload” basis. No matter how efficient this process becomes, it does nothing to advance the understanding of how to “mainstream” online education within the full-time faculty workload process (usually accomplished through the academic departments), should that become a desired direction for the institution to take.

III. INSTITUTIONAL TRANSFORMATION

Mainstreaming online learning within an institution will require vision and leadership on both the administrative and academic sides of our institutions. Many of the most important short-term issues are administrative: how to fund course development; how to support the new needs for technical help and other student support issues; how to ensure a flow of resources back to academic units that take faculty members from their regular teaching to reach out to online learners; how to decide what services should be supported centrally and what should be provided locally; how to deal with the breakdown of traditional areas of administrative authority and “turf” as innovation is diffused throughout the institution.

Other issues, however, strike at very important academic issues: how to recognize faculty contributions when their individually authored content is shared by other faculty; how to champion a new pedagogy; how to effectively assess and evaluate all aspects of the performance of online courses; how to hold faculty members accountable for their use of online materials in a blended environment; how to ensure curricular coherence across sections of a course or across campuses.

Institutions that have made their online learning management system ubiquitous for faculty and students alike—rather than a restricted-access tool available only for formal instruction—have seen a rapid acceptance of the online environment for co-curricular activities (informal discussion groups, student clubs, professional societies, etc.). This extension is part of the mainstreaming process and raises additional questions about how to fund and support the co-curricular infrastructure without hindering the quality of delivery for formal instruction.

A. Defining a Transformation Community

While any major change requires leadership, institutionalizing change cannot be accomplished by one person working in a vacuum. Transformation requires a community of people in different parts of the institution, each with their own advocacy role, their own contribution to mission, and their own sense of ultimate ownership.
Constituencies that need to be involved in the transformative process, and benefits, are:

<table>
<thead>
<tr>
<th>Constituency</th>
<th>What can be Transformed</th>
<th>Key Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty</td>
<td>Scholarship, Educational Programs</td>
<td>Time-to-market for educational programs,</td>
</tr>
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<td></td>
<td></td>
<td>Wider markets for high quality educational programs,</td>
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<td></td>
<td></td>
<td>Faculty collaborations</td>
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<tr>
<td>Executive/Middle-level</td>
<td>Systems, Policies, Procedures, Resource Allocation</td>
<td>Reformed mission and core values,</td>
</tr>
<tr>
<td>Administration</td>
<td></td>
<td>More effective development and implementation of education.</td>
</tr>
<tr>
<td>External</td>
<td>Boards (private and public), Political Bodies (e.g. legislatures), Accreditation Bodies</td>
<td>Improved institutional accountability, standards, congruent with improving education</td>
</tr>
</tbody>
</table>

Table 1. Constituencies in Transformation Community

Community involvement at all levels of the organization or system is a key for successful transformation. The role of executives during periods of incremental change is different than it is during transformational times. During periods of incremental change, executives reemphasize mission and core values, delegating incremental decisions to middle-level managers: “The overall system adapts, but is not transformed” [4].

Middle-level managers also play a crucial role. Sayles points out that “middle managers often become the players who can facilitate necessary trade-offs among the diverse parts of any work system” and “it takes a middle manager to get senior management’s attention and make the case for change” [5].

To accomplish institutional transformation, members of the community will need to acquire new skills and information, or hone existing skills, including: leadership, strategic planning, building a shared vision, communication, systems thinking, and networking.

B. The Transformation of Higher Education

The movement of online learning from the beginning of innovation to the complexity of a college of university mainstream involves many different aspects of the institution’s culture and is at the core of its mission. During the innovation phase of online learning, the emphasis is on the experiences and performance of individual faculty members and students and on how to sustain a program over time. As online learning enters the mainstream, these considerations are joined by broader concerns over core administrative and financial processes, fundamental questions of pedagogy, and, as many institutions are seeing, challenges to traditional assumptions about who does what within the institution, about what decisions and services are centralized and what are decentralized, and, ultimately about who we serve and how we support them. Mainstreaming this innovation is transformative.

Moreover, the transformation is not driven only by internal decisions. As we move into the second generation of the Information Revolution, the external demands on our educational institutions are changing. Increasingly, students come to our institutions expecting to use technology, expecting to collaborate online, expecting to challenge faculty ideas by “googling” them during class and IM’ing fellow students with the results. Increasingly, adult professionals understand that they need recurring access to formal education throughout their careers and expect to be able to have access without giving up their jobs and moving their families to the institution that can best meet their needs. Increasingly,
employers expect their staff to be able to work in a virtual environment, expect them to function effectively in online global working teams and learning communities. Increasingly, communities expect their universities to educate students to be effective citizens in an information society.

The challenge is being able to enter into completely new and innovative partnerships and business relationships with other institutions of higher learning world-wide as well as with traditional businesses and vendors.

The ultimate transformation of higher education will be determined by how well institutions mainstream online learning into their curricula, into their business practices, and into the broad academic culture of their institutions in order to respond to these external demands.

IV. QUESTIONS TO CONSIDER ABOUT ALN BUSINESS MODELS AND INSTITUTIONAL TRANSFORMATION

1. What was your primary institutional goal for initial engagement in ALN: to extend access or to improve quality?

2. What business model was chosen to implement ALN: within continuing education or distance learning, under academic departments or the provost’s office, or some other model? How well matched was the business model to attaining your initial institutional goals for ALN?

3. As you have gained experience in ALN, how have your goals expanded and/or changed? Have these new goals been institutionalized? How well are they understood throughout the institution as a whole?

4. What institutional policies, procedures or structures present challenges in meeting your new goals? Is the business model for ALN still well suited?

5. What key members of your institutional community, at various levels and functions, should constitute the ideal team to lead institutional transformation through ALN?

6. What new skills and information do individuals on this leadership team need in order to effect change?

V. REFERENCES

VI. ABOUT THE AUTHORS

**Gary E. Miller** is Associate Vice President for Outreach at The Pennsylvania State University, where he serves as Executive Director of Penn State Continuing and Distance Education. He was the founding Executive Director of Penn State World Campus, the University’s online distance education program. Dr. Miller is the author of The Meaning of General Education: The Emergence of a Curricular Paradigm and numerous journal articles and book chapters on distance education and the undergraduate curriculum.

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ONLINE LEARNING: NEW MODELS FOR LEADERSHIP AND ORGANIZATION IN HIGHER EDUCATION

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ABSTRACT
Online learning is now reaching the core, helping to transform higher education and moving beyond isolated efforts to pervasive influence and change. The dichotomy of distance learning vs. campus-based education has broken down, and forward-looking senior administrators have embraced new approaches to education that contain the elements of successful online education while cultivating the community-building and branding of site-based education, particularly to promote enriched faculty and program development. Rather than being isolated in a distance learning task force or continuing education program, the conversations about online learning now occur—or need to occur—at the executive level and throughout other levels and structures.

KEYWORDS
Institutional Transformation, Leadership, Strategic Planning, Community, Scalability

I. LEADERSHIP: TRENDS AND NEEDS
Because of growth and scale, things that once could have happened under the radar have begun to attract the notice of senior administration. The need for top-level leadership is, in other words, a function of the progress and growth of online instruction. Online education can’t be ignored any longer. If it has taken root, it needs top-level attention to making progress on a broad scale.

Innovation in early stages can be scattershot and highly localized, and so it tends to be centrifugal in effect. However, generalizing innovative practices across an institution and reaping institutional benefits is necessarily centripetal and systematizing. Generalizing innovation must be done carefully and strategically to guide rather than quash innovation.

Work and leadership in innovation must be seen as multi-level. At the top are high-level executive sponsors who have little to do with implementation but may be critical in green-lighting a strategic approach to online instruction; middle management is critical for mobilizing faculty and support; faculty actually do online instruction; and department chairs or program heads either bless or obstruct their involvement in it. Given the need for players at every level, leadership is much more about orchestrating the interaction of all the stakeholders than providing direction in a top-down manner.
One of the discoveries leadership has made in working with online instruction (a discovery sometimes made the hard way) is just how vital support systems are. Increasingly, support systems for all students have been built on successful strategies for reaching out to distance students. But service models in many campuses still focus predominantly on campus-based students, typically a matter of making the student come to the service instead of the other way around. As online services reach (and perhaps become) the mainstream, resources need to be shifted to improve services for all students rather than compartmentalizing services. In some ways, as leaders must recognize, the providing of services online, even more than the delivery of courses online, needs to be brought into core operations. A coherent support structure is essential.

II. LEADERSHIP IN ONLINE PROGRAMS: MULTIPLE ROLES/TASKS

Because the principal change agents are those managing new modes of delivery—and brokering the meshing of the old and the new—the pivotal leadership comes from them, dependent as they are on those above and below, on executive sponsorship and on the full cooperation of support staff and engaged faculty. Such leadership is a matter of bridgework as well as trailblazing, and the people who carry it out need to be aware of complex tasks and multiple roles.

A. Advocacy and Integration

Getting colleagues to adopt and adapt is vital. It involves making what is new familiar without short-circuiting its transformative value. Although they sometimes began as separate or satellite enterprises, online programs need their own integrity; for full growth and impact they also need integration with the larger academic enterprise. Therefore, advocacy of online instruction—a new means of instructional delivery and interaction—is also a means of practicing sound pedagogy, upholding quality by accomplishing longstanding goals and the general mission. This delicate relationship to the status quo—changing the student constituency even while serving it, for instance—is critical.

B. Academic and Curricular Leadership

One thing that makes leadership in online instruction especially complicated is that it does in fact entail academic and curricular leadership. Pedagogical advances tend to be concentrated in online instruction, and they are more easily shared once made; the growth in collaborative work, active inquiry, and so on has much to do with the development and visibility of such practices in online instruction.

Sharing can of course make faculty not engaged in such work feel threatened. And it really isn't enough to placate them with assurances that online instruction is basically old wine in new bottles, because that isn’t the case. Teaching online is not merely using a different medium; the medium itself has a transformative effect. At the same time, there has to be an insistence that courses offered online are commensurate with traditional, on-the-ground courses: they must meet the same goals and satisfy the same requirements. Walking this tightrope between what is genuinely new and different and what is nevertheless commensurate with established practice is a special challenge to leadership in this area.

C. Program Building and Change Management

Much of standard academic enterprise is predicated on maintaining what is in place: ensuring ongoing instructional delivery, quality, and support. Online instruction is a growth area that can never simply maintain, but must perpetually grow and develop. Partly, online instruction is a response to demand
(always outpacing supply), and partly, it is a fact of technological change (which never stands still). What’s more, the two are connected: technological change is not just change, but improvement: systems become more stable and scalable, while their integration with other systems (such as student information management, registration, and more) becomes both possible and even necessary. Even a start-up plan has to envision long-term growth, and an established program can never rest on its laurels but must always be ramping up to new levels of growth and outreach.

D. Liaising with Information Technology
Teaching with technology means working with technologists. In the university setting, many if not most of the technologists came in to serve administrative rather than academic purposes, and the divide is sometimes described in terms of “two sides of the house.” Technology support on the academic side has to be more flexible and less mechanized (or systemic), more adaptable and responsive. When it comes to working with users, leadership in online instruction often is forced into the breach, becoming a buffer between the two sides even as the division between them blurs. After all, it is becoming increasingly difficult to draw the line where one kind of IT (Information Technology) stops and the other (Instructional Technology) begins. Course management systems interface with student information systems and other college administrative systems. Creating systems that are useful to both on-campus and off-campus faculty and students sometimes leads to duplication or confusion. An integrated system allows for greater use and performance by faculty and others, but at times threatens data security. These are important questions as the campus extends beyond its walls.

E. Faculty Development
Faculty development may be the single most central piece of any program and the single greatest leadership challenge. The Sloan surveys [1] have indicated that faculty buy-in is the great bottleneck, but then faculty sit precisely where workload concerns are concentrated and where the perceived threat posed by online instruction seems greatest. Such concerns cannot be waved away or addressed by mere training in the technology. Any change in instruction is, perforce, a matter of pedagogy, and that is never adequately addressed by a recipe-like how-to approach.

The challenge is exacerbated in institutions of higher education, since, unlike K–12 instruction, colleges and universities really don’t have a culture of professional development. Its presence is typically a localized and temporary thing that is often compared to setting up the evangelical tent and attempting conversions—something that almost never lasts, partly because the grant money that makes it possible can’t last either. Faculty development is such a leadership challenge because it must be done with and (not just to) faculty. Faculty must take ownership of the methods and models and must share in leadership.

The challenge for effective faculty development is considerable, and rising to it has what is arguably the greatest pay-off, the greatest shot at institutional and cultural transformation. Precisely because it is so critical to effective online learning, and is so sporadically manifest elsewhere in academic culture, faculty development for online learning is poised to become the focus of faculty development and pedagogical transformation in institutions of higher education generally. Often Centers for Teaching with Technology become Centers of Teaching and the change is not just nomenclatural. Effective faculty development for online learning is another transformative element that needs to move from the margins to the core.

Faculty and faculty development are also changing as new generations of faculty appear. Emerging generations of faculty will influence existing faculty and development models. Online interaction with
students as a daily activity can mean that managing an online discussion does not seem like a chore, but this requires a cultural shift from concentrating teaching in blocks of time to distributing it across the entire week. Mitigating factors such as the reward and tenure system predicated primarily on publications may act as a brake on creativity and development in areas dedicated to “teaching,” but such factors are also susceptible to reform; they may even, ultimately, act as accelerators rather than brakes if properly devised. Of course, this depends upon the institutional mission, which must itself evolve.

III. ORGANIZATIONAL MODELS FOR CHANGE — THE POSSIBILITY OF CONVERGENCE

What are the appropriate organizational models? So much is contingent on where the institution is, what purposes online instruction is supposed to serve, and more. But the growth of online learning, its rhizome-like reach into all aspects of institutions of higher education, poses the intriguing possibility that we are converging on a single, integrative model, albeit from different directions.

A. Outward-reaching vs. Inward-focused

It would certainly be possible to develop a much more complex typology, but outward-reaching vs. inward-focused were the chief points of departure for organizational models:

- Programs that were started primarily as separate programs for outreach to bring in new or specific student populations, or
- Programs that were started to take advantage of tech-mediated delivery for existing populations, sometimes more through blended learning than fully online learning.

Interestingly, there is some indication that the two are converging—that the programs that began as separate from the mainstream are now merging with it, even “capturing the core,” while those that began with a sense that it was time to use 21st century methods on a well-established mainstream and mission are discovering that those methods create possibilities of access for new-expanded as well as traditional student populations.

B. The Institution Itself as a Determinant of Direction

As convergence occurs, how online education is ultimately organized depends more on the nature of the institution than just how online instruction first took hold within it. We know, for example [1], that public institutions are more likely to have made significant progress with online instruction than private institutions (particularly small liberal arts colleges). The institutional mission that is fundamentally about outreach and service is more congenial to the start and growth of online education than the institution that attracts (usually affluent) students with the promise of small student/faculty ratios and instructional and social intimacy.

Such observations are hardly counter-intuitive. A greater challenge is envisioning how online instruction will itself change institutional mission in the long run. How important will institutional branding become? How important will it be to accommodate cross-institutional enrollments? How much will student populations shift from on-campus to off-campus? How much will students want to mix modes of delivery in putting together their individual academic programs? One especially strong possibility is suggested by two things in particular: (1) the near-ubiquity of online instruction in institutions of higher education, at least as some kind of presence and option, and (2) the remarkable, almost incalculable growth of blended learning: since students may have access to online instruction from local (as well as distant) providers.
The key element in anytime/anyplace instruction will probably be more a matter of time than distance, scheduling flexibility than sheer access.

Models of change must plan for growth in student populations that had formerly had only a part-time presence or no access at all because of work schedules, parenting responsibilities, and so on. Such growth means growth throughout the institution, not just in enrollments, but in support services of all kinds. It also suggests the need to rethink timeframes of instruction on a much larger scale than heretofore. The rationale for the 14-week term because class could only meet three specified hours a week will be radically undercut. Ultimately, there could be a profound redistribution of resources, teaching staff, and administrative focus that models of change would need to accommodate as foreseen outcomes of projected growth, rather than as unexpected shocks to the system.

C. Modeling Change Throughout Levels/Units

Everything said thus far stresses that any organizational model for change is going to be deployed within an organization undergoing change—and so has to foresee and accommodate such change. Some changes are fairly easy to predict—a tendency toward increasing integration, for instance—but what these mean to different units and programs and campuses (in a multi-campus structure) is far less predictable. We are still relatively ignorant of what discipline- or program-specific dispensations may obtain in online instruction. A fairly generic approach to online education may be representative of first-phase implementation rather than an ongoing condition. In a multi-campus system, similar programs may be consolidated, but they may also present a welcome redundancy for students for whom scheduling flexibility is the chief desideratum. Such questions have to be worked out at all levels: they pose clear challenges for everyone from senior administrator to department head, and these challenges further suggest that the leadership of online instruction specifically will have to broker the confrontation of such challenges.

D. How Academic Uses of Technology Get Defined and Supported

Treated to some extent already (see the leadership role “Liaising with IT”), the issue of technology support is actually a still larger issue brought to the fore by the fact that tech-mediated instruction is still more pervasive than online instruction. Competing claims to technology on the academic side need to be sorted out—“smart” classrooms vs. “virtual” ones, high-tech hands-on science labs vs. online simulations, and so on. The best way to sort out competing claims while taking the long view may in fact be to “flip the script.” Instead of asking, as formerly, what purpose online education is to serve, it may be time to ask what special needs and purposes of campus-based education can be expected to persist.

E. The Bridging Function of Online Education

The positive side to the challenges we’ve been outlining is that they all speak to the way online instruction is increasingly the fulcrum of an institution's future. The ubiquity of tech-mediated teaching—its tendency to pervade and so to bring together all aspects of an institution of higher education, to reach throughout the curriculum, to make demands on every aspect of resource management—makes it the logical place to weave together the new and the old, the academic and the administrative, the technological and the traditional. Like the technology it uses, online instruction has an integrative function in the compartmentalized universe that is the university. In a multi-campus institution, for instance, its capacity to foster cross-campus enrollments can help knit disparate units together, while its focus on faculty development can give pedagogy an attention that transcends disparate departments, even kinds and levels of instruction.
F. The Need to Bring All the Stakeholders In
Easy to say, hard to do. The key thing may be that, in an institutional setting, due consultation rarely takes the form of a general plebiscite. The obligation to engage in due consultation is more a matter of communication than a referendum. The one imperative is always forward mobility: inertia cannot triumph in the face of a need for a change management decision, but a decision cannot be so preemptory as to harden resistance or invite stonewalling (the one thing that is, from a change management perspective, even worse than inertia).

G. The Critical Need to Engage in Strategic Planning
Strategic planning once meant a master plan, then the follow-through, an exercise that was about as cyclical and sporadic as accreditation self-study. Now strategic planning is (or at least needs to be) an ongoing process of revolution by evolution. Minimally, plans need to be done annually, but always with a long-term dimension over the next 3–5 years. Ideally, the committees that prepare strategic plans have to be on-going and comprehensive, representing all the interests: administration, tech staff, faculty, students.

Ultimately, institutions need to break from the old model of strategic planning to a formal, continuous improvement cycle. For one thing, strategic plans tend to be focused on units—separate documents for separate endeavors—and institutions need to plan strategically in ways that are broader, more integrative, and more continuous. The advent of new or significantly changed technologies—portals, ERP, broadband, wireless networking, blogs, wikis, and more—changes the nature of the game. These things become features of the landscape, though not always in ways originally envisioned or intended. Being able to respond to such changes requires that planning is not an event but a perpetual process. There needs to be a body that monitors trends as well as institutional implementations, a group as broadly representative as possible and as pro-active (as opposed to reactive) to such change as possible.

H. New Models for Faculty
For the sake of efficiency (and, from students’ perspectives on accessibility and navigability) there probably needs to be some uniformity in the delivery of online instruction. How this is achieved (e.g., by course management systems or instructional design teams) will vary, but certain principles need to be operative. First among these is probably the effective integration of technology in teaching, or, as another way of putting this, a wariness about anything that distances the faculty from issues of delivery that are (or have impact on) important pedagogical choices. Instruction that is egregiously uniform (template-driven) is probably suspect; similarly, the so-called “disaggregation of the teaching function” (the breaking of the teacher’s role into a variety of roles, from “master” teacher to discussion leader, from examiner to grader, from course planner to instructional designer or “course builder”) has been touted as a cost-efficient means of improving “faculty productivity,” but such approaches have their downsides, and there needs to be careful planning and assessment of such ventures. In the largest and longest view, the balance that needs to be struck here is part of a large balancing act between centralization and decentralization, uniformity and diversity, stability and innovation.

IV. CENTRALIZATION VS. DECENTRALIZATION
What processes should be centralized or decentralized for most effective implementation and organization of online learning at an institution or within a system? How should work and funds flow be rationalized?
The question of centralization vs. decentralization can be reframed as that of consolidation vs. differentiation. Consolidation maximizes efficiency and control, whereas differentiation heightens innovation and a sense of local ownership. The ideal situation is probably one in which matters of resource management are centralized, while the means and methods of instruction those resources make possible are largely controlled by those doing the teaching.

But because such situations are never static, even such an ideal situation must accommodate negotiation and change. If, for example, there is a common course management system, faculty using it must feel they have input and flexibility. And even if faculty have some control over the delivery of instruction, there must also be a way of regularizing its delivery so that centrifugal forces don’t take over.

Particularly in some of the larger regional or state systems there has been outsourcing of some major aspects of programs such as course platforms, servers, and help desk support to either a commercial provider or a centralized unit. This consolidation does maximize some efficiency and allows for shared investment in improvements. It does at times lead to challenges when faculty have high stakes in the look and feel of a course management system once they get comfortable. High-end technology faculty also are interested in innovative uses of technology, when the more consolidated systems sometimes lack agility and responsiveness. (We need to acknowledge that it is not just that technology is changing teaching; teaching keeps pushing and changing the technology.)

A. Mapping Patterns and Directions

Given the dynamic forces, what an institution really needs is not a model but a mapping of where and how things are moving. So much of that has to begin with where things were focused initially (growth and outreach vs. “capturing the core”).

Even if we agree that there is an ideal balance, that is never where and how things begin, and the one great question for change management is how to direct the way things are toward where they should be. Programs that begin as independent operations need to move from satellite status to roles that are increasingly integral; diffuse experiments by faculty need to be corralled, especially for the sake of disseminating such experiments. A program that began as an administrative mandate has to secure faculty buy-in; one that began as a faculty-led initiative needs administrative backing and support. In each case, the movement toward a balance of consolidation and differentiation must not lose its benefits as it seeks to extend them.

B. Bottom-up, Top-down, or Both

Neither bottom-up or top-down approaches could be prosecuted exclusively, even if that were desirable. Because advantages and disadvantages inhere in both approaches—bottom-up tends to be more centrifugal but innovative, top-down more centripetal in effect but also more generic, more homogenizing—leadership needs to find a way of avoiding the disadvantages while securing the benefits.

To maximize benefits, it is critical to manage the timing and not just the direction of change. A grassroots approach to online education quickly assumes the character of “random acts of innovation” if such work is not brought into larger focus and purpose; and this needs to happen so that it seems a facilitation of such work rather than a reining in. Similarly, an administrative initiative cannot begin too soon to cultivate faculty support and to solicit faculty consultation.
C. Ideal Distribution

Though the possibilities and choices are richer in a “both/and” than in an “either/or” universe, it is important to have clear, goal-directed management. A goal need not be a destination; it can be a way-station. And in an institution with both bottom-up and top-down impulses and effects, the way to travel is clear: the dynamic should settle into issues of ownership (local) and support (general)—the direction is the diffusion of innovation but efficiencies/synergies of central support.

There is no more powerful disincentive than the sense that online instruction is an external imposition and a threat to the faculty prerogatives, but there is no surer way to scuttle a program than to have breaks in the chain of resource management. Faculty engagement tends to flow to programs where pedagogical ownership is at the level of the teacher and the discipline, but support is consolidated and consistent throughout the institution.

V. QUESTIONS FOR FURTHER DISCUSSION

Higher education institutions are examining the interfaces between online and blended learning, profit-centers and centralized programs, part- and full-time faculty, and even exchanges beyond departments and institutional boundaries. How do institutional leaders at each level consider the most effective program design issues and implement institutional change? Executive sponsors may encourage strategic approaches to online instruction, but middle management must mobilize resources and department chairs in most institutions must approve. Do “normal procedures” allow for transformation?

Do higher-level administrators know enough about online and tech-mediated instruction? Do we need a kind of administrative development as well as faculty development? If so, how might that be pursued?

Is higher education converging on an integrated model for online learning, even though we have come from many different places of origin for online learning?

We have framed issues of consolidation versus differentiation. In the ideal, should resource and information technology management be centralized to maximize efficiency and the means and methods of instruction, which use those resources, be decentralized to promote differentiation? Do models based on cost recovery work?

Has online education had real impact on the core of our higher education institutions? Have we focused on what drives us, and where we can excel [2]? At the leadership level, have we transformed with core administrative and student services functions?

What are the impact of online education and higher level discussions of faculty roles? How will or should growth and dissemination affect part-time/full-time ratios, models of faculty development, processes of program approval and faculty governance, tenure and reward structures, and so on?

How is innovation in higher education supported at the local level, but then encouraged to spread?

How good are institutions of higher education at anticipating change so they can respond proactively rather than reactively?
Do we need to rethink the standard instructional models (term length, contact hours, classroom usage, residence requirements, etc.) more extensively?

How much should change be driven by student preferences, especially those shaped more by convenience than need? Do we know enough about student preferences with regard to the different modes?

VI. REFERENCES


VII. ABOUT THE AUTHORS

George Otte is on the doctoral faculties of the CUNY Graduate Center programs in English, Urban Education, and Technology and Pedagogy. Since March 2001, when he was named Director of Instructional Technology for CUNY, he has been supervising CUNY Online, the City University’s faculty/course development program for online instruction, supported by the Sloan Foundation.

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THE TIMES THEY ARE A-CHANGING

Carol Scarafiotti
Rio Salado College

Dr. Martha Cleveland-Innes
Athabasca University

Come gather ‘round people
Wherever you roam
And admit that the waters
Around you have grown
And accept it that soon
You’ll be drenched to the bone.
If your time to you
Is worth savin’
Then you better start swimmin’
Or you’ll sink like a stone
For the times they are a-changin’
By Bob Dylan

ABSTRACT

Higher education is engulfed in change. At the same time that institutions of higher education are endeavoring to transform themselves by integrating information and communication technologies into curriculum delivery, student profiles are changing. Low income-ethnic populations are among the fastest growing segment of 18–24 year old students; male enrollments are lagging in comparison to female; and the “digital natives” have arrived. Also, as the Internet provides students with access to a myriad of global educational opportunities, the potential for serving virtual foreign students increases. These changes present challenges and opportunities to institutions of higher education, which strive to serve their constituents through fully online and blended learning formats and aspire to extend education to new markets as well. This paper raises implications for online learning related to changing student populations. It presents two fundamentals crucial for ensuring student success, as well as, access in an online environment. Finally, it recommends two change strategies.

KEYWORDS
Access, Learners, Digital Natives, Institutional Transformation

I. FROM ACCESS TO CHOICE:
BACKGROUND FOR THE MOVE ONLINE

Access to education has been and remains a primary driver of the distance learning movement. The potential of online learning to enhance access to education is primarily determined by the learner’s circumstances [1]. Online learning’s predecessor, distance education, has been applied to several situations in which access to education is problematic.
The first situation is one of sparse population—and occurs where the community of learners is spread over a wide geographical area. The fledgling University of the Arctic is an example of a response to this situation.

The second occurs when a very large population has access to a limited number of “seats” in conventional educational institutions. Consequently, mega-universities, distance teaching universities with 100,000 students or more, have developed. Examples of mega-universities are Indira Gandhi National Open University (IGNOU), with an estimated 500,000 students and the Open University of Hong Kong (OUHK), with over 400,000 students. In both of these cases, the learner’s physical environment presented a need that online learning could address.

The third situation deals with adult learners whose complex lives restrict their opportunities to access education through traditional pathways. This profile includes but is not limited to full-time employees, full-time parents, family caregivers—those who need the convenience and flexibility of learning and studying at times and places that work with their schedules.

And now with the ongoing evolution of digital communication tools that students use in their daily lives, a fourth situation is emerging. Many of the younger learners are not so much seeking access to education as they are a preferred way of learning, learning that aligns with the information age skills they have acquired [2].

II. ENROLLMENT TRENDS AND UNDERGRADUATE DEMOGRAPHICS

Currently, in North America, all four of the above mentioned factors will continue to create a demand for new learning modalities. Higher education’s enrollment projections and changing student demographics listed below reveal that more needs to be done to provide access; access that has not been uniformly available, geographically, or socially through traditional post-secondary education.

- Overall, higher education degree-granting institutions will continue to experience enrollment growth, with a 19% increase between 2000 and 2013, or from 15.3 to 18.2 million according to The National Center for Educational Statistics (NCES) Projections of Education Statistics 2000-2013. This growth will be characterized most by increasing numbers of 18–25 years olds, whose numbers will expand by 22% between 2000 and 2013. In comparison, enrollments of students 35 years and older will increase by only 2% [3].

- It is predicted that enrollment growth for female students will outpace that of men, 21% compared to 15%. The same forecast shows an increase in full-time students of 22%; in part-time students, 13%; in undergraduate students, 18%; in graduate students, 19%; in public institutions, 18%; and in private institutions 20% [3].

- Predictions of enrollment increases do not and will not apply equally across the states. According to the U.S. Census Bureau, the ten most populous states as of 2004, presented in rank order, are: California, Texas, New York, Florida, Illinois, Pennsylvania, Ohio, Michigan, Georgia, and New Jersey. However, the states in the top ten list differ when viewed by highest percent of population change. California, New York, Illinois, Pennsylvania, Ohio, Michigan, and New Jersey drop to lower positions and are replaced by Nevada, Arizona, Colorado, Utah, Idaho, North Carolina, and Washington [4]. A similar view from the Society for College and University Planning (SCUP) indicates that over the next 10 years, 17 states, located mainly in the West, will experience more than
10% growth with traditional 18–24 year olds and likewise that “seven rust belt” states will experience lower growth in both traditional and nontraditional student populations [5].

- Higher education’s undergraduates will continue to be more heterogeneous as viewed from the data in the NCES report, *The Condition of Education 2004*. Over the past ten years the percent of white students has decreased, while that of other racial/ethnic groups has increased. “Combined, minority students represented nearly a third of all undergraduates in 1999–2000, up from about a quarter in 1989–90” [6]. Watson Scott Swail, president of the Educational Policy Institute in Washington D.C., indicates that by 2050 the 18–24 year old cohort will be predominately of color and by 2100, 50% of this cohort will be Hispanics and Asian Americans [7].

- Students are incurring more cost in their efforts to attain an education, and their ability to manage the cost of higher education and institutions’ ability to support first generation and low income students will be factors in determining completion results. According to “Paying for College, Changes Between 1990 and 2000 for Full-Time Dependent Undergraduates,” college prices and financial aid both increased during the 1990s, and the increases in tuition and fees outpaced both inflation and growth in the median family income. The same period saw an increase in the percentage of full-time, dependent undergraduates who received financial aid (consisting primarily of grants, student loans, or both) [8].

- The trend of students who work while attending school is likely to continue. In addition to working adults who attend college, an increasing number of college students in the 18–24 year old category work either part-time or full-time. Over the last 10 years the percentage of students working full time increased seven percentage points [9].

- The Society for College and University Planning (SCUP) indicates that it is taking longer for students to attain degrees and not everyone who starts attains their goals. Only 55% of students who start college complete it within six years [10]. This is the new reality for students across age groups—multiple role learners who juggle busy lives. This new reality will continue to affect time to completion and completion rates as workload issues become more likely to interfere with studying.

- The undergraduate student body is mobile with 59% of undergraduate students attending more than one college [10]. Most likely the expansion of fully online education will increase the number of such mobile students who will demand more efficiency transferring credits from institution to institution.

### III. THE ARRIVAL OF THE “DIGITAL NATIVES”

Higher education is facing changes not only in student demographics, but also changes in students’ skills and approaches to learning. Marc Prensky’s often quoted phrases “digital natives” and “digital immigrants” illustrate the differences between the students who grew up with technology and those older students and faculty members who had to develop new skills in order to assimilate into the digital world. These terms ring truer than ever today [11].

The May 2005 edition of *Wired* features, “digital native,” Emma Maree Urquhart of Inverness, Scotland, describing her as a “hack addict” who wrote a best selling fantasy novel about teens trapped in a virtual reality game. Upon completing the novel, she searched the Internet for publishers and succeeded in getting her novel published locally as well as in the UK and the USA. The BBC is considering a Dragon Tamers TV series, and Warner Brothers and Miramax are dangling film offers. In the meantime, 13 year-old Emma hired her dad as her agent [12]. Emma represents those students who, with each decade, become more eminently skilled with technology than their predecessors. And more like Emma are on the way. In an article in the Arizona Republic, June 2005, the Education Department reports that almost one in four children in nursery school has used the Internet.
As of 2005, 18 to 24 year olds born between 1980 and 2003, referred to as Millennials, NetGen, or the YGeneration, are enrolling or are enrolled in institutions of higher education. They are the generation that takes technology “for granted.” For them, computers, the Internet, cell phones, personal digital assistants (PDAs) and digital cameras are merely tools and devices used in everyday life. They are sophisticated consumers who want options, customization, the ability to “try before they buy”[13].

The Educause eBook *Educating the Net Generation*, edited by Diana and James Oblinger, describes these students as “visually literate,” uniquely able to “weave together images, text, and sound in a natural way.” They are able to piece information together from multiple sources. They prefer inductive discovery, and because of their ability to shift their attention rapidly form one task to another and to respond quickly, they expect rapid responses [14]. This group will adjust rapidly to online learning environments and welcome to opportunity to use well-developed competencies in the learning environment. Likewise this group will be frustrated by outdated online learning milieus such as text heavy online courses which merely replicate the content in a textbook or by faculty who refuse to use technology enhanced communication in their courses.

**IV. GLOBAL STUDY AND TRANSNATIONAL HIGHER EDUCATION**

While prospects abound for institutions to adapt the learning experience to the mind set of the digital natives, equally interesting opportunities exist in the global education market. Global competency is seen as key to a strong citizenry and competent business leaders, yet less than 1% of college age students travel to study abroad. The knowledge, skills and attitudes required to appropriately maneuver an international, multicultural and multilingual world are best gained through direct experience with people of other cultures. Technology offers the opportunity for post-secondary institutions to provide students cross-cultural experiences using information and communication technologies linked to cross-cultural communities. Recently, the American Council on Education [15] partnered with the AT&T Foundation to offer an awards program that recognizes institutions using technology for international study at the undergraduate level. This version of online education is designed to enhance undergraduates’ international learning at U.S. post-secondary institutions.

Also available is the more challenging opportunity for transnational education in developing nations. “We are at the beginning of the era of transnational higher education, in which academic institutions from one country operate in another, academic programs are jointly offered by universities from different countries, and higher education is delivered through distance technologies,” claims Philip G. Altbach, Director of the Center for Higher Education at Boston College [16].

In the current global education marketplace, an average of 2 million students study outside of their home countries. However, a market of 2 million students pales in significance when considering that developing countries contain half of the world’s students and lack the capacity to meet the demands of these populations. Consider China, where currently eighty-five percent of its college age cohort is not served by existing Chinese universities and colleges. Table 1 below shows the ten most populous countries by 2010 [17].
Table 1: Countries Ranked by Population: 2010

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Population</th>
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<tbody>
<tr>
<td>1</td>
<td>China</td>
<td>1,347,563,498</td>
</tr>
<tr>
<td>2</td>
<td>India</td>
<td>1,155,011,202</td>
</tr>
<tr>
<td>3</td>
<td>United States</td>
<td>309,162,581</td>
</tr>
<tr>
<td>4</td>
<td>Indonesia</td>
<td>258,824,837</td>
</tr>
<tr>
<td>5</td>
<td>Brazil</td>
<td>195,579,661</td>
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<tr>
<td>6</td>
<td>Pakistan</td>
<td>179,592,311</td>
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<tr>
<td>7</td>
<td>Bangladesh</td>
<td>159,765,367</td>
</tr>
<tr>
<td>8</td>
<td>Nigeria</td>
<td>145,032,482</td>
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<tr>
<td>9</td>
<td>Russia</td>
<td>140,771,044</td>
</tr>
<tr>
<td>10</td>
<td>Japan</td>
<td>127,194,656</td>
</tr>
</tbody>
</table>

The availability of technology to make online learning accessible to developing countries continues to increase. IT Facts indicates that (according to the Chinese government), over one hundred million Chinese people are using the Internet, ranking China (among global Internet populations) second to the USA with 135 million users. Likewise, India with 25 million internet users is expected to grow to 100 million by 2007–08 [18].

As cell phone technology proliferated to developing countries where the infrastructure did not exist for telephones, so it appears will wireless technology, making it possible to connect with hundreds of thousands of potential students who previously were locked out of education. The following statistics from census data reveal that a global move to wireless and broadband is underway:

- Wireless data access experienced a 29% increase in global wireless Internet users in 2004.
- Fifty-four percent of the general adult population in Japan has wireless Internet access, far ahead of runners-up South Korea, with 28%, and the US, with 20%.
- Of the 12 countries studied the bottom three were Russia, with 2%, Brazil, with 3%, and India, with 4%.
- Today there are more than 150 million broadband subscribers worldwide, according to IMS Research.
- More than 51 million have signed up for service since the beginning of 2004.
- The number of broadband subscribers will surpass 400 million in 2009 [18].

V. IMPLICATIONS FOR ONLINE LEARNING IN HIGHER EDUCATION

Overall, the market for online learning continues to be strong. Students from many of the groups described thus far will continue to seek more convenient, flexible learning opportunities, as well as learning experiences that correspond with their digital skills. Additionally, students in states and countries where access to those traditional on-campus seats is becoming more competitive will look for cost effective online learning opportunities. Below are questions/implications for consideration by both higher education institutions currently involved in online learning and those considering its potential.
1. Does the predicted enrollment increase in traditional aged students present greater opportunity for a blended approach to online learning? And likewise, will the 2% predicted growth in students 35 years and older result in fewer enrollments in fully online programs?

2. What should institutions do to capitalize on the continuing robust female market for online learning?

3. Could a new approach to online learning or new programs appeal to the declining male market? For example, are there implications in data such as UCLA's Higher Education Research Institute (www.gseis.ucla.edu/heri/heri.html) report where during their last year of high school approximately 23% of freshmen men (now enrolled at UCLA) played video games 6 or more hours a week while 28% spent 6 or more hours on homework?

4. How can institutions in states where enrollment declines are predicted offer online programs with a national and international appeal?

5. As more low-income and first-generation students seek educational access through online learning, what kinds of support need to be in place to ensure their success?

6. Can able and ambitious high school students be a new market for online higher education?

7. Do existing online courses and programs reflect the level of sophistication expected by digital natives and if not, what needs to be done in order to attract and retain these students? Is the online technology infrastructure up-to-date and adequate to meet the expectations of the digital natives?

8. What approaches are needed to encourage faculty members to incorporate new competencies such as visual literacy into the learning experiences that they provide?

9. The global market for online learning appears to have tremendous potential for those institutions able to provide virtual affordable educational programs. How can higher education institutions partake in this market? What are the characteristics and components of successful online transnational programs?

10. What is the responsibility of institutions involved in online learning with the issue of national and international transfer of credits?

VI. TWO TRANSFORMATIVE ONLINE LEARNING FUNDAMENTALS

A. Support for Students Learning Online

Armed with the awareness of the changing social context, higher education institutions seeking the integration of successful online programs must develop the ‘soft’ methods of administrative structure, organization and process support—efficiently and effectively—so that offering increased access will also ensure entry to a satisfying and successful education—not just availability.

While higher education has successfully provided support for learners for years, a number of things must now be considered as education delivery moves online. NASPA, the National Association of Student Personnel Administrators in the US, suggests that the distance learning student population needs different support services provided in imaginative ways. It is also likely they will need more support because, at least for those totally online and at a distance, there aren’t even the informal structures or campus rhythms to guide them. This means there has to be innovative extensions of what is done on campus and unique offerings for learners attending at a distance. According to the Western Cooperative on Educational Technology (WCET), all students deserve access to a full array of student services [19]. Until these are provided, it is unrealistic to expect the same levels of student success and retention between on-campus and the ‘new’ version of ‘off-campus’ (online) courses. Consider this—distance students are essentially commuter students who use a different vehicle (e.g., Internet vs. automobile or bicycle) to arrive on campuses. Additionally, today’s students participating in all methods of delivery expect services to be available at a time and place convenient to them. In all cases, this is readily achieved by putting services online.
There is a difference “between providing cyber-services and creating virtual communities” [20] for students, particularly for students who fall into this new category of ‘off-campus.’ Those studying and engaging the campus through computer networks need not only digital information and access to administrative services, but also a sense of attachment and belonging to the larger institution. Technology provides improved access to courses and services; critical to the provision of a satisfying student experience the development of a campus community that embraces both the physical and virtual campus.

The movement of learner support services to online environments has much momentum. In fact, this transition is causing many institutions to rethink their entire service delivery system. This could add tremendous value to student support, as long as it is realized that the support required to help students adjust to working online must be added; it cannot be assumed that students are well prepared to do so. It is this transition to working online that is the subject of research by Garrison, Cleveland-Innes and Fung [21] identifying the second crucial fundamental: a ‘new role’ for learners in online education.

B. New Role for Online Learners

Institutions need to be proactive with support as learners adjust to the online environment. While not all learning activities involve online learning, it is likely that, in the near future, a portion of all learner activities will involve working online.

“In a global society based on expanding knowledge … health as a civil society and its economic competitiveness, as well as the success of individuals …., will hinge on having the best possible education and access to lifelong learning opportunities. Around the world, online learning—the use of digital networks to deliver and support learning opportunities—has emerged as a powerful and transformative means to meet these learning needs, as well as to extend and enrich traditional modes of instruction, at the post-secondary level.”

Adapted from the Advisory Committee for Online Learning [22]

This prediction applies equally to all western, industrialized nations. From the perspective of the individual, learning online requires the development of competencies in the role of ‘online learner.’ As a new social role, the pathway to competence will occur over time as the role becomes normalized, or ‘usual.’ In this early stage, online communities will contribute to the socialization process for those engaging in this new role.

‘Role’ is used here as a sociological construct, defined as a collection of behavioral requirements associated with a certain social position in a group, organization or society [23]. At its most general level, role expectations are dictated by the social structure. Individuals who engage in the role are guided, through a process of socialization, to appropriate role performance. Socialization then refers to the “process by which people learn the characteristics of their group … (and) the attitudes, values and actions thought appropriate for them” [24].

Under conditions of long-standing roles, individuals engage in ‘role-taking’ behavior, where observation and mimicry of role models allow those new to the role to ‘practice’ appropriate role behaviors. ‘Role making’ occurs as individuals construct aspects of the role with their own individual meanings and satisfying behaviors attached. This occurs under social conditions where such individual autonomy is allowed. It also occurs where role models are not readily available, and construction of the role is required.
The Times They Are A-Changing

Such is the case for becoming an online learner. An adjustment from the more generalized role of learner, the responsibilities and requirements of working online are not readily apparent to those new to the role. The transition to, and adjustment in, the role of online learner, is part of the current social climate in online learning. While maintaining the usual expectations and privileges attached to the role of learner, online learners add such things as:

- knowledge about, skill with and acceptance of the technology,
- new amounts and modes of communication with instructors, peers and administrators,
- increased levels of learner self-direction, and
- a new ‘place’ for learning in time (anytime, usually determined by the learner and their life circumstances) and space (anywhere, dependent upon equipment requirements).

Institutional support services need to provide a vision of what counts in this new role, and offer assistance, information and guidance during the adjustment process. As individuals are exposed to new experiences and obligations in online environments, identity with the role of online learner will emerge. The definition of role, according to externally defined requirements, provides the structure within which an individual identifies him or herself. Role identity acquisition is part of the individuation in the experience of working online. Each online learner engages in the experience of learning online and the process of role taking and role making occurs concurrently within the learning experience.

The context within which this role adjustment occurs is also undergoing change. In other words, the adoption of online education can act as a catalyst for institutional transformation on many fronts, aligning institutions with requirement of a new social order [25]. This highlights the depth and pervasiveness of change occurring in post-secondary education; awareness and action are an institutional imperative in higher education.

VII. STRATEGIES FOR RESPONDING TO CHANGE

The integration of online education—replete with the structures, philosophy, roles and outcomes appropriate to the delivery method—into higher education institutions, and the intended transformation based on this action, will not occur without specific, strategic action [26].

A. The “Hedgehog” Concept

Leaders from successful online eColleges and universities argue that a critical first strategic action involves a clear understanding of the purpose behind the proposed transformation to online learning and its relationship to the institutional mission. A 2005 study of successful Internet–supported learning institutions conducted by the Alliance for Higher Education Competitiveness indicates that a top factor correlating with degree of success is “consistency of Internet-supported learning with the institutional mission.” “To successful institutions, Internet-supported learning is an opportunity to reconsider the intersection of mission and student service and to create an improved educational product”[27]. In other words, the type of online learning programs provided should align with the rationale for providing it as well as with the culture of the institution.

An equally helpful insight on commencing institutional transformation comes from Jim Collins, author of Good to Great. His study of companies which transformed themselves from “good-to-great” discovered that their leadership had an innate understanding of the company culture from three viewpoints and that this understanding guided the company’s strategy. He uses Isaiah Berlin’s metaphor of the Hedgehog and Fox to illustrate the power of this understanding. Hedgehogs “simplify a complex world into a concept that guides everything” while foxes’ efforts are diffused and scattered as they frequently change their
Applying the Hedgehog concept to the development on an online learning strategy requires first that the institution’s leadership answer three questions in relationship to the online learning initiative.

1. What drives the institution’s mission? In answering this question it is important to assess the source of the culture’s passion. For example, is the institution excited about extending educational access to working adults? Is it institution passionate about improving learning?

2. Where can the institution excel? Determining what the institution currently does best is a good starting point. For example, is the institution renowned for providing programs in high demand areas? Is it noted for its extensive technology infrastructure?

3. How can the institution sustain the initiative? The question is about what drives the institution’s economic engine and what effect that has on the initiative. For example, it will be important to understand the cost of online learning as part of the business model and benefit to the college.

Institutions positioning themselves in the online learning marketplace, while considering changing student demographics, would do well to take the time to clarity and understand their “Hedgehog” concept. Once the “hedgehog” concept is understood, the institution is ready to begin mobilizing the campus to initiate the change.

B. Mobilizing the Campus

The institutional change required to embrace online delivery is comprehensive and integral. The move to blended and online delivery, with the required student support, carves out a ‘new deal’ in higher education, where student needs become a central focus—all the way from accessible and open admission and transfer credit arrangements to online special interest groups providing social interaction so important to young adults in higher education.

These changes challenge many central premises that support the 800 year history of higher education. The changes require that administrative and academic staff reposition their roles in light of a new role for students. These adjusted roles and ways of doing business mean adjustment and growth on the part of all involved—change of a magnitude unprecedented in the history of higher education. Gardner [29] points out, “little systematic account is taken by faculty members, or university administrators and governing boards for that matter, of how today’s undergraduate students prefer to learn” (p.24). Most traditional universities use a pedagogy that is steeped in the past and have failed at large-scale integration of the full potential of technology. He further suggests that it is possible to explain but impossible to defend an “institutional hesitancy in responding to distance learning possibilities and related issues bearing on the time, manner, and place of the teaching function, including the age and other changing characteristics of the student body” (p. 24). Most importantly however, technology provides an open learning environment in which student are active learners and consumers of educational services.

At the same time, faculty are resisting the required responsibilities to make the transition to technologically mediated teaching based on the increased workload demands and the limited technological infrastructure currently available [30]. The development of a new role for students in higher education will not emerge without concomitant changes to the complementary role of faculty. “It is the faculty that do the actual teaching, and convincing them of the value of a new and unproven delivery method is a formidable challenge [31, p.20].
Evidence of the success of the delivery method and its increasing implementation is now available. This evidence must be communicated to faculty, in disciplinary language they are familiar with. Social change in self-governed, disciplinary based institutions requires multiple activities at all layers of the institution; success requires a central imperative to change and support from leadership, “vision creation, consultative design and collaborative action” [32]. A complex system of emergent, dynamic and stagnant forces create a kaleidoscopic context within which higher education presents, maintains and creates itself. Never has the requirement for systematic, strategic effort to manage the higher education enterprise been more important.

Strategic planning is a critical response that institutions of higher education should choose in order to address this complexity, in a way that allows for greater control over future activities and direction. In stressing the need for strategic planning, Swenk [33] suggests that “to remain viable and vibrant, institutions must develop new social technologies that allow for much more flexible responses.” The challenge is to develop systems, planning, and institutional thinking that enables short-term planning and reaction to emergent demands that are coupled with support for the long-term development of disciplines and quality assurance systems [34]. Strategic planning is the most logical way to address this challenge of online education as a delivery method.

VIII. CONCLUSION

The Sloan Consortium’s second annual study on the state of online education indicates that, overall, online education is Entering the Mainstream and that most schools currently engaged in online learning view it as “critical to their long-term growth strategies [35]. Social change in self-governed, disciplinary based institutions requires multiple activities at all layers of the institution; success requires a central imperative to change and support from leadership, “vision creation, consultative design and collaborative action” [32, p. 31]. At the faculty level, institutional requirement supported by grass roots support for knowledge and skill development make the critical combination. Identification of competent change agents willing to champion new directions at the level of more intimate professional and personal relations are key.

Thus, the “changing times” present institutions of higher education with many challenges and also opportunities to meet the needs of students everywhere through some form of online learning. The author’s conclude by urging institutions to move forward with their necessary transformations, noting the prescient advice of Bob Dylan.

As the present now
Will later be past
The order is
Rapidly fadin’.
And the first one now
Will later be last
For the times they are a-changin’.

IX. ABOUT THE AUTHORS

Carol Scarafiotti, Vice President Emeritus at Rio Salado College (a Maricopa Community College), currently serves as Executive Consultant for Online Learning at Rio Salado College. A recipient of the Sloan C Award for Excellence in Online Learning, she is known for her leadership experience in online learning systems.
Dr. M. Cleveland-Innes is Associate Professor in the Center for Distance Education at Athabasca University. She is an award winning scholar in distance and higher education with an active research and publication program. Current research interests are in the sociology of distance education, disciplinary differences in higher education and distributed learning in the workplace.

X. REFERENCES


CASES OF INSTITUTIONAL TRANSFORMATION

The Pennsylvania State University
University of Texas TeleCampus
Rio Salado College
The City University of New York
Athabasca University
Empire State College

ABSTRACT
Six institutions provide snapshots of some of the major transformative effects of online education.

KEYWORD
Innovation, Metrics, Inter-institutional Programs, Change Adeptness, Hybrid Courses, Rates of Degree Completion and Progress, Pace of Change

I. PENN STATE WORLD CAMPUS

The Pennsylvania State University is a multi-campus land grant university with a long history of involvement in distance education and educational technology. The University includes, in addition to its University Park campus, 19 undergraduate campuses, an adult-centered graduate center, as well as campuses focused on medicine and law. It was one of three universities that founded distance education in the United States and has a long history of innovation with educational technology dating to early uses of instructional film.

In the mid-1990s, The Pennsylvania State University embarked on what would become a commitment to innovation with online learning, leading to a transformation in how the University uses technology to provide access to its curriculum and to ensure quality. Perhaps the most visible of these innovations is the World Campus, Penn State’s online distance education program, which began in 1998 and which now offers 21 undergraduate and graduate degree and 33 certificate programs and noncredit programs, generating more than 20,000 course enrollments annually worldwide. While the World Campus was helping Penn State’s academic units reach new students, other initiatives were focused on using online learning to improve undergraduate instruction on campus: the most significant of these has been the Courseware Initiative, led by Information Technology Services and Undergraduate Education, supporting the transformation of several high-enrolling courses, both improving instruction and addressing issues of cost-effectiveness.

As the World Campus grew, smaller undergraduate campuses saw the need to use online learning to attract and hold students in an increasingly competitive environment. A Course Sharing Task Force recommended creation of the E-Learning Cooperative, a mechanism by which World Campus courses and other online courses could be shared across campuses to further increase access. The Provost funded a Blended Learning Initiative to create new courses to meet the needs of the campuses; this is being led by the World Campus, in coordination with Information Technology Services and Undergraduate Education.
Within the last five years, several colleges have created their own instructional design centers to support the development of online courses for use on campus, for delivery by the World Campus, and for inter-campus delivery. The early leader in this trend was the Dutton e-Education Institute in the College of Earth and Mineral Sciences, which develops undergraduate courses for use by undergraduate campuses, as well as full degree programs for World Campus delivery.

By 2005, it was clear that these activities were having a transforming effect on Penn State. The President and Provost called for the creation of “Penn State Online,” to bring the various resources for course development and delivery into greater coordination. These developments have further institutionalized the role of the World Campus and have begun to create a new leadership community for online learning at Penn State charged to shape this ongoing transformation.

II. UNIVERSITY OF TEXAS TELECAMPUS

Institutional change can come crashing onto the scene with a fury, or it can be a slowly evolving self-revealing truth. In the case of the University of Texas TeleCampus (UTTC), the latter has certainly been the case. The TeleCampus operates at the System Administration level of the University of Texas System. Created in 1998 originally to provide services to distance education students at all of the 15 member institutions in the System, the TeleCampus quickly moved into offering collaborative online degree programs. The initial tasks were centered on changing policies and procedures, breaking down barriers, and creating communications channels where previously none existed. This was accomplished using the usual tools, (financial incentives, evangelism, coercion, and political arm-twisting), but the long term solution was to demonstrate value and quality.

From the outset, the TeleCampus made a conscious decision to “count things” and thus began to collect metrics on as many different aspects of the operation as possible. This gave UTTC an ability to answer specific questions when asked, but also to demonstrate consistent quality. The metrics included details such as enrollment numbers, growth rates, course completion rates, student and faculty survey responses, and of course a host of financial measures. Combined with “soft” data points in the form of student and faculty comments, these data allowed the TeleCampus to demonstrate value to policymakers and stakeholders who initially were dubious regarding the concept and practice of online education.

Having a small but dedicated marketing and communications group has proven valuable as well. Through their work, enrollments grew at a significant rate. In addition, they regularly nominate TeleCampus courses and programs for a variety of state and national awards—awards which provide external quality validation. All together, the ability to demonstrate quality and value has become a strong force in UTTC’s quest to affect institutional change.

The first few years of operation yielded success, but on a small scale. A small number of programs and modest enrollment allowed the TeleCampus to fine tune processes and build infrastructure for the anticipated growth to come. After the first few years, however, something interesting began to happen. The various campus administrations across the System began thinking of the TeleCampus as a strategic asset available to them, where previously they saw only an experiment.

The collaborative nature of the TeleCampus, working to build inter-institutional programs, had the unintended benefit of creating communications channels where none had existed before. Because policies and procedures to support online students needed to be crafted “from scratch,” silos of academic and administrative units began to talk. Remarkably, this happened not only between campuses, but even on
individual campuses themselves, where many of the units had little history of interaction.

A fundamental shift in the thinking of many of the campus’ senior administrative officers became apparent by the 4th year of TeleCampus operation. We were brought to the table to discuss what role online might have in helping to address the pressing strategic issues facing higher education: improving graduation rates, increasing building utilization rates, broadening access.

To be sure, there are still some who question the validity of online delivery. Many, however, have moved from doubters to believers. They have become the agents of change within the system.

III. RIO SALADO COLLEGE

“Sustaining any profound change process requires a fundamental shift in thinking and action. We need to think of sustaining change more biologically and less mechanistically. This requires patience as well as urgency.”

Peter Senge, from The Dance of Change

With a college mission to “transform the educational experience through choice, access, and flexibility; customized, high quality learning design; and personalized service and organizational responsiveness,” Rio Salado College’s leadership views intuitional change as a crucial force behind the college’s vibrancy and its success. Over the last ten years as the college sought to rapidly institute major changes in its curriculum, educational delivery systems, and approaches to student services, it became apparent that the college concomitantly needed to evolve and nurture a culture which would sustain profound changes as well as embrace the concept of change. In other words, the college wanted its employees to be more naturally “change adept.”

Today at Rio Salado College being “change adept” means that at all levels of the institution, employees understand:

- Change is an important aspect of the college;
- They have the opportunity to participate in the planning of changes that involve them;
- How to help themselves and other move through the natural stages of concern associated with change;
- They have a responsibility to support college change initiatives.

The concept of being “change adept” is introduced formally and nurtured informally through the following:


Mandatory for all Rio employees, this is a three-day college culture immersion workshop. This workshop, offered several times each year, includes (along with other topics associated with Rio’s culture) training in:

- Total Quality Management- to provide employees with the needed skills to participate in planning efforts;
- Change adeptness—which includes the stages of change and exercises for dealing with change; and
- Skills of a learning organization.
Participants in each workshop represent a cross-section of Rio’s employees, and Rio’s own employees conduct the workshop sessions.

2. The College Culture Page
The college culture page containing the Rio Salado College vision, mission, and core values is strategically placed throughout the college to remind employees about the importance of these concepts. Although change adeptness is not a college core value, it is a foundational underpinning of these values and is reinforced by the culture page.

3. Employee Rewards and Recognition Program
This program helps to nurture the concept of being “change adept” on a more personal level. In this program Rio employees nominate fellow employees whose efforts or actions exemplify Rio’s core values. All of those nominated receive college core value icons and a wall plaque on which to display them. Their nominations are posted in the weekly electronic President’s Bulletin.

Thus, over a period of several years the concept of change adeptness has become an explicit characteristic of the Rio culture and definitely assists with the preservation of profound changes.

IV. THE CITY UNIVERSITY OF NEW YORK:
ONLINE INSTRUCTION AS DISTANCE LOCAL EDUCATION
Institutional change is most often reactive. Occasionally, it is proactive. And then there are those times when it's hard to tell. The recent development of a special online degree for degree completers at The City University of New York (CUNY) is a case in point.

CUNY had been working with online instruction since 2000, when a union-imposed moratorium on distance learning was lifted. Supported by funding from the Sloan Foundation, hundreds of faculty were trained to offer online courses to thousands of students. Not a campus or even a discipline was untouched; online courses were offered at every kind and level of instruction. As the faculty development project reached deeper into the mainstream, hybrid courses (half online, half on-campus) became an increasingly prevalent alternative to fully online instruction.

Still, the reasons to put instruction online were largely up to the instructor. The University as a whole had all the students it could handle, literally on its doorstep. But soon changes—including substantial faculty hiring—prompted another look at what might be done with online instruction.

Research on a national scale also provided impetus for reconsideration. Blended learning or hybrid instruction, often going on under the administrative radar, seemed to be growing rapidly, partly because institutions that had been doing fully online instruction found how much they were (or might be) serving local populations. The annual Sloan surveys documented the extent of online instruction, including the fact that it was offered by well over 90% of public institutions of higher education. If you wanted online instruction, you could get it locally.

Student interest was out there, not least of all locally, but what would be the institutional driver for change? And what were the risks? What, for instance, would prevent online instruction from simply
drawing students out of classrooms and playing to convenience rather than need?

A clue lay in an emerging crisis in higher education: the problem with rates of degree completion and progress. National statistics showed that it took nearly 7 years, on average, to finish a 4-year degree. And a growing number of students failed ever to complete the degree. According to ACT’s ongoing study of retention and completion, BA/BS completion rates at 4-year public colleges have been falling from a high of 52.8% in 1986 to a 20-year low of 39.5% in 2005.

CUNY turned to its own institutional research, which showed that, over the last six years, 64,000 students left in good academic standing (with a GPA of 2.0 and a minimum of 30 earned credits)—and without going to any other institution of higher learning. Focus groups revealed academic difficulty was not the issue, nor were problems with CUNY specifically. What then? To do a global paraphrase of the students queried, “Life happened”—the need to work full-time, to provide child care, and so on. And so, for so many, the door to a college degree was shut.

Realizing that online education could eliminate the scheduling difficulties that have defeated so many students, CUNY has an online baccalaureate program for degree completers ready for a Fall ’06 roll-out. It speaks directly to the matter of access, the heart of CUNY’s mission, and it allows the leveraging of all the work that followed the lifting of the ban on distance education—online instruction is now for a local population for whom time, not distance, is the issue.

V. ATHABASCA UNIVERSITY

The term ‘institutional planner’ is not a common occupational category in post-secondary institutions. At the same time ‘institutional planning’ is a required occupational activity for many, if not all, people holding positions in these institutions. Planning is a necessary response to changing social conditions, and change has become a constant imposition for several decades in the post-secondary enterprise. The needs of our emerging information and technology-based global economy, new complexities of postmodern life, the accelerating pace of change and increasing demands for competent, high-skill performance in the workplace are dependent on an appropriate educational response.

How, then, is such a response crafted at post-secondary institutions? “It is the job of planners to construct a process for change” [1]. A large, publicly funded degree-granting institution underwent major transformation in its curriculum delivery, using a strategic planning process that encompassed all aspects of campus life. Under conditions of such transformation, the following required tenets were identified:

- Broaden perspectives of those involved to help them understand current and evolving needs of key stakeholders and determine how best to address those needs.
- Synthesize individual perspectives into an institutional perspective to create a statement of future direction, values and priorities.
- Focus on what is fundamentally important, creating opportunities to eliminate unnecessary work and providing a focus for managing change.
- Strengthen connections among all campus community members by improving communications, establishing common goals, increasing cooperation and coordination, prioritizing and sequencing workloads and enhancing bottom-up participation.
- Equalize the knowledge base amongst participants and eliminate conjecture based on incomplete information and intuition by establishing a fact base.
- Anticipate and tease out ‘issues’, which are at the root of most organizational conflict and lack of
cases of institutional transformation

- Link change activities to existing operating plans, which serves to foster consistency, conformity and continuity of action and effort.

For Athabasca, success was evidenced by the production of a quality product that was embraced across the campus. New models of online delivery must be appropriately accommodated across disciplines and fields of study, but can have an individualized campus look and feel, based on an integration of campus values, priorities and desired direction, providing a sense of ownership, familiarity and predictability.

VI. EMPIRE STATE COLLEGE: HOW FAST TO CONVERT?

Many institutions face the dilemma of changing delivery methods while continuing to serve existing student populations with legacy systems. All levels of leadership in an organization have a role to play in making decisions on how fast a change can be implemented and maintenance of multiple models.

Empire State College was founded by Ernest Boyer within the SUNY system in the 1970’s to serve adult learners. Two predominant program delivery models emerged over the first twenty-five years. In most of the College, faculty worked with adult learners in individualized learning contracts through regional learning centers throughout New York State. In the Center for Distance Learning, faculty developed structured learning materials through print packages and electronic mail. Distance learning faculty worked with students, still in a highly individualized manner at a distance. The Center for Distance Learning was an early starter in online education in 1996 and had developed fifty fully online courses. Students began combining individualized study with group-based online learning.

Because of resource limitations, the Center for Distance Learning was considering ways in which the print individualized study approach could be preserved and continue to grow the online program to serve learners in groups. Faculty and staff were highlighting the important aspects of both learning methods. The Dean and planning committee had laid out a plan to convert the remaining 150 courses over five years. The plan was supported by the educational technology staff. During a resource planning session, the President asked if and why the Center’s faculty believed the online learning courses were the most effective option for the particular adult learners that were currently served or could be served. After hearing the answer, he asked why the Center wanted to retain the print independent study methodology for five years. Wouldn’t the costs of maintaining the legacy system and the new online systems cancel the opportunities for new development and the synergies of working more intensely? The President and the leadership discussed the resources and at the end of the conversation asked, “What would it take to convert the entire curriculum in one and a half years?”

This leading question showed confidence in the power of transformation. When Empire State College decided to forge ahead and support the conversion in this short period, there were many in the faculty who believed we were going to lose significant numbers of students who would not like the move to entirely online. In fact, the program continued to grow at the rate of 15% each year. While the year and a half required large amounts of dedicated work, it also allowed faculty and staff to focus on the mechanics of the conversion. The synergies that were created by having all of the department chairs, instructional designers and technical support engaged for a short and focused time allowed for higher levels of engagement in course design and in the improvements of management and technical systems.

A leadership case study can be made for knowing when to have confidence in the quality of your model and intended directions at all levels and when to push for a focused and intense conversion, rather than a
calculated model with slowly executed steps. This effort has now allowed technical resources to be directed to creating greater blended opportunities within New York State and the independent study models.

VII. REFERENCE

BUSINESS MODELS FOR ONLINE LEARNING: AN EXPLORATORY SURVEY

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ABSTRACT
Despite the rapid growth in the adoption of online learning, there is a dearth of detailed information on effective business models, business strategies and effective practices on which to build sustainable online education programs. A survey instrument was developed as an initial attempt to define business models and business strategies for online learning. The survey results yielded some interesting data about which online learning financial models seem to have more or less “control” of which business functions. The sample was a convenience one and as such will require further filtering of data. It is also clear that more needs to be done to define business strategies and models and thus provide guidance to this growing segment of higher education.

KEYWORDS
Online Learning, Business Strategies, Business Functions, Business Models for Online Learning

I. INTRODUCTION
Despite published research on the business side of online education, there are few in-depth examples of the business strategies, business models and business success factors used in higher education degree-granting institutions for sustaining online learning. There is a lack of information to help guide business decisions, such as best practices or benchmarks, from the different perspectives of different types of higher education organizations.

The number of institutions that need this information is growing. The majority of higher education institutions in the United States are now using some form of distance education. According to the National Center for Education Statistics, 56% of two-year and four-year institutions offered distance education courses in 2000–2001 [1]. Of these, 90% offered Internet courses using asynchronous computer-based instruction. Corroborating these findings and indicating continued growth are the National Sloan Surveys of Online Learning [2, 3, 4] using data from 1000 representative higher education institutions in the United States. Evidence from 2003 shows that 81% of all institutions of higher education offered at least one fully online or blended course and 34% offered a complete online degree program. Sixty-seven percent indicated that online education is a critical long-term strategy for their institution [3].
An exploratory investigation by Schiffman [5] confirms the desire and need for business models, strategies, methods and benchmarks. Schiffman identifies business issues such as revenue distribution and generation, compensation, planning, student services, course and degree regulation, marketing, sources of capital, cost management and product development. Confirmed by Schiffman’s project is the need to expand access and generate revenue through online learning.

Discussions in an online Sloan-C workshop on the Business Issues of Online Learning in Spring 2005 demonstrated a strong need for to identify and document critical information for decision-making. Workshop participants affirmed that issues such as marketing expenditures, program design strategies and faculty compensation are strongly impacted by the business context in which programs are developed and delivered. For example, an institution using online learning primarily for non-credit professional development programs has very different objectives, resource constraints, and levels of control over business factors than an institution focused on expanding access to its credit programs.

Applying successful models and strategies from other institutions requires knowledge of the similarities and differences in the organizational contexts. This paper begins the process of identifying the most common contextual variables that have an impact on business issues and using them to create categories for identifying peer institutions.

II. REVIEW OF THE LITERATURE

Despite the rapid growth in the adoption of online learning, there is a dearth of detailed information on effective business models, business strategies and effective practices on which to build sustainable online education programs. What has been published on the business side of online education tends to focus on the costs and economic models, the growing for-profit sector, and new organizational approaches such as spin-offs and virtual university consortia. There are very few detailed, descriptive studies focused on the business models, strategies and effective practices of online education in U.S. degree-granting institutions.

Cost and economic models for distance and online education have been examined by noted experts in the field such as Bates [6]; Bishop [7]; Daniels [8]; Finkelstein, Frances, Jewett & Scholz [9]; Rumble [10, 11] and Twigg [12, 13, 14]. The for-profit sector has been described in detail by researchers such as Kelly [15] and Harley, Lawrence, Ouyang and White [16]. Virtual university consortia have been inventoried by the National Alliance of Statewide/Regional Virtual Learning Colleges and described by Johnstone [17, 18].

A few notable compilations of case studies have been published profiling different aspects of distance and online learning. Sloan-C has published a number of detailed case studies in the Sloan-C Series focusing on cost-effectiveness and other business aspects of institutions [19, 20, 21]. Carchidi [21] analyzed organizational forms of virtual delivery in postsecondary institutions and included five descriptive case studies. Daniels [8] profiled the world’s mega universities. Jewett [23] and Young [24] published a series of cost-benefit case studies that included some aspects of the distance learning business models of eight different U.S. institutions. Witherspoon [25] described the purposes and practices of twenty-two early adopters of distance and online learning in the U.S. including some aspects of their business models.

Most recently, a study by Curran [26] used example case studies to describe the business strategies of U.S. and European institutions engaged in online learning. Findings identified 13 strategies for increasing access, enhancing quality and containing costs. Curran concluded that “Striking an appropriate balance
between pedagogic strategies, scale of provision and resource expenditures remains an inherent challenge for the future development of e-learning” [26]. Though Curran’s study is a useful identification of different overall business strategies, it does not include detailed information, such as success factors, for decision making or practitioner implementation.

This review of the literature indicates a noticeable lack of practical, published information on the business models used in higher education institutions, particularly non-profits, to run the business side of online learning. There is a need to identify and share information on what works to accelerate success and adoption of successful models.

III. METHODOLOGY

The authors created a set of questions based on research studies [5, 26]. The test questions were beta tested with a group of Directors and Deans who were recognized as running highly successful online learning departments. After the beta test a 21-item questionnaire was finalized. The final questionnaire collected demographic information on each responding university/college/organization and the respondents’ views of their own business practices. The demographic data collected information about the type of college and specific information about its current online learning business. Besides the demographic questions, there was a mix of open-ended and Likert-type questions. The other question types were inclusive multiple choice questions.

IV. FINDINGS

The findings were useful for gaining further insight into how organizations integrated business strategies into the procedures for online learning. The findings are clearly of an exploratory nature. The results of the survey with this sample seem to indicate that financial models drive many business strategies.

A. Overall Demographics

The survey was distributed via email on the Sloan-C listserv, the NUTN listserv, UCEA listserv, and the Sloan online research study. The convenience sample yielded a total of 128 responses from 110 unique institutions. Since this was an initial exploratory survey and it used a convenience sample, it is not clear whether the population is representative of the colleges who offer online learning. Several demographic factors do seem to differ somewhat from the latest annual Sloan-C survey on online learning and from other benchmark data sources.

The convenience sample which responded was more heavily skewed to those offering graduate and baccalaureate degrees than would normally be found in the US higher education market.

<table>
<thead>
<tr>
<th>College Classification</th>
<th>Sample Percentage</th>
<th>Carnegie Classification*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctoral</td>
<td>31%</td>
<td>7%</td>
</tr>
<tr>
<td>Master’s</td>
<td>24%</td>
<td>16%</td>
</tr>
<tr>
<td>Baccalaureate</td>
<td>22%</td>
<td>15%</td>
</tr>
<tr>
<td>Associates</td>
<td>17%</td>
<td>42%</td>
</tr>
<tr>
<td>Specialty</td>
<td>2%</td>
<td>19%</td>
</tr>
</tbody>
</table>

Table 1. Reported and Actual College Classifications

*Source: http://www.carnegiefoundation.org/Classification/CIHE2000/Tables.htm
Based on those who offer online learning as reported by the annual Sloan-C survey on online learning, the data is also skewed toward the upper degree offerings. In the 2004 Sloan survey, Associates colleges offered the most online learning, followed by masters, doctoral, specialty and finally baccalaureate [2]. The latest data showed growth in baccalaureate degrees but remains skewed to graduate and associate providers offering more online courses then other institutions [1]. The data did fall in the middle of those reporting whether they where public or private institutions as benchmarked against the Department of Education statistics and the Sloan-C survey. In the convenience sample, 70% reported being public while the Department of Education reports 60% of all institutions are public. The Sloan-C survey data shows public institutions offering 83% of all online learning. The private institutions numbers are reflected as follows: 30% in the convenience sample, 40% of all Department of Education institutions, and 17% of those offering online learning.

The following demographic information was provided by the respondents. The respondents reported having the following number of enrollments: 15% had less than 500 enrollments; 14% had between 500 to 1000 enrollments; 30% had between 1001 to 5000 enrollments; 13% had between 5001 and 10000 enrollments; 26% had over 10001 enrollments and; 3% choose not to answer. Most of the respondents offered only for credit courses and programs. Another survey question asked how many of the enrollments were from traditional students. The answers varied greatly. Forty-four percent indicated that traditional students accounted for less than 25% of the enrollments; 19% indicated traditional students accounted for between 26% to 50% of all online enrollments; 11% indicated that 50% to 75% of all enrollments came from traditional students and; and 23% indicated that more than 76% of the enrollments came from traditional students.

Over 50% indicated that their online enrollments accounted for less than 10% of the total enrollments from the institution. The majority, nearly 75% of all respondents, indicated that the total number of programs, certificates or certifications numbered less than 25. The most common types of programs were masters followed closely by bachelors, then associates and doctoral. Respondents were asked in a Likert-scaled question what their reasons were for offering online learning. The top reasons for offering online learning were enhancing the value of the university brand and contributing to extension efforts followed by returning a surplus to the university. If only the ‘very important’ answers are included then contributing to extension was the top reason followed by returning a surplus to the university. Respondents indicated that contributing to speed of graduation and on-campus student retention were only of ‘minor’ or ‘not important’ reasons for offering online learning.

Respondents were also asked how online courses were designed. The majority of responses indicated that generally faculty or staff by themselves designed courses. Some institutions indicated that faculty developed courses so that others could deliver them and some answered that teams of faculty and staff developed courses so that teams could deliver them. The differentiation could be described as the first choice continues the traditional practice of individual faculty creating and delivering courses; the next two choices are closer to a master faculty developing for others to deliver; in the final choice, faculty work with staff to develop courses that others can deliver. The last model is more like the approach typical of corporate training.

All the data were cross-tabulated to look for patterns and relationships. No clear relationships emerged from grouping institutions by their demographic likenesses. On the other hand, grouping the institutions by the business model as described below provided some interesting patterns of what functions were controlled by various business models.
B. Identification of a Business Model

Using terminology that was tested with several colleagues, the researchers decided to ask survey respondents the following question:

<table>
<thead>
<tr>
<th>Which business model best describes your current online learning operations?</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent unit that is self-funded</td>
<td>25</td>
</tr>
<tr>
<td>Independent unit that is overhead-funded</td>
<td>9</td>
</tr>
<tr>
<td>Independent unit that is for-profit</td>
<td>1</td>
</tr>
<tr>
<td>A college, department or school within the university which is self-funded</td>
<td>29</td>
</tr>
<tr>
<td>A college, department or school within the university which is overhead-funded</td>
<td>43</td>
</tr>
<tr>
<td>Other...</td>
<td>21</td>
</tr>
<tr>
<td>Did Not Answer</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 2. Types of Business Models

As can be seen three business models were most predominant in the list: (1) Independent self-funded, college, (2) department or school within the university which is self-funded or college, and (3) department or school within the university which is overhead funded. What is also clear is that many respondents felt none of the choices correctly identified the business model. Most of the respondents in the ‘other’ category explained that their institutions were a mixture of the business models. Clearly, more work needs to be done on identifying the best terminology for these business models. However, the groupings did provide a way to look for patterns in what units control which business functions.

The following charts use the three predominant types of business models and break-out business functions by the focus areas of student services, business decision making, and curriculum planning. Student services functions are plotted against the three models. The direct control of student services showed the least amount of variation in the respondents’ answers. It seems as though most colleges have agreed—regardless of how they initiated the business of online learning—that student services, technical support and control for quality needs to controlled by the unit offering online learning. However, it is less clear who should be responsible for retention. It is worth noting those respondents from the over-head funded unit overall felt they were almost 25% less likely to have control over this business function than respondents from other business models. The retention for non-credit is almost a misleading question, since most respondents indicated that very little of their offerings were non-credit.
The business decision making plotted against the model also showed more contrasts than student services. For the most part, the college or independent units which are self-funded had very similar answers except for their control of partnerships and removal of products from the market. The college overhead-funded model differed especially in regard to controls. None of the data indicates, however, that one type of unit is more successful than another. It is clear that the college overhead-funded units must work with more internal partners to make these decisions. That implies that processes must be worked out over time to address how the primary college/university will respond to these functions. It is entirely true that the lack of control over some business decisions could result in less efficient processes and be a disadvantage as well to colleges with overhead-funded business models.
In the third chart, where curriculum planning is plotted against the model type, the largest variations seem to exist amongst the models. The overhead-funded unit has very little control of faculty selection and curriculum creation. If the unit can not control or impact the creation of curriculum, it can not respond to business opportunities in online learning. There also seems to be some disconnect among the respondent answers. The college overhead-funded unit indicated it could impact the quality learning experience, yet one of the major tenets of the student learning experience is faculty. If the college overhead-funded unit can not hire faculty, then it seems that the quality learning experience could be impacted. It is possible that the college has other mechanisms in place to make sure faculty teaching online will provide a quality learning experience.
C. Open-text Discussion of Business Challenges

Respondents were asked what the biggest business challenges they faced were. The responses, as might be expected, varied widely. Of the 128 total responses, 100 took the time to add an open text business challenge. Coding and counting of the responses indicated some of the biggest challenges were faculty, staffing, investment, constantly changing environments, managing quality, and support for students and faculty. Many faulted faculty for slowing down how quickly the university could offer courses online. Others indicated that faculty wanted more quality control but did not understand how online learning works. The responses clearly evoked a sense that these units were not in control of the academic experience and shared many responsibilities which make delivery of a quality learning experience difficult.

Other issues reported by the respondents included paying for development and developing the right business model and marketing analysis for return on investment. Many indicated the central university did not have a process for return on investment and estimating marketability of courses or degrees. A few respondents indicated that the university had trouble with any investment in courses since they did not believe new on-campus courses required investment. The lack of appropriate marketing knowledge was also voiced as a business challenge. The challenging issues also included quality control issues like which students to admit, how to support students with what types of services (tutoring for instance) and maintaining a high level of retention. A few responses stated that it was difficult to get central administration support for growth and investing in new technologies.

D. Limitations

While some conclusions can be drawn from the survey, the data set used is limited in its scope. The survey provides much preliminary data to further investigate the complex issues involved. It will be worth
refining the definitions of business models and the strategies controlled or influenced by the online learning unit. That information will allow for further hypothesis testing on whether there are required business strategies for an online learning unit to be successful.

The research will also begin to define terminology for those who manage online learning units at their own institutions. Furthermore, it is very important to continue to share this research for the benefit of the entire ALN community.

V. DISCUSSION OF FINDINGS

As an exploratory study, the survey has added a great deal of knowledge about business model research for online learning. There appears to be some connection to the Miller and Schiffman thesis (in this issue) that colleges started their online learning operations to meet either access or quality needs of the institution. Given the starting point and the reality that most online learning colleges started from an access point then it becomes clearer as to why enhancing brand value, returning a surplus and contributing to extension are the most important reasons for offering online courses. There appears to be connection to other research discussing the difficulties and lack of guidance in establishing business rules for online learning which differ from the rest of the university offerings [7, 16, 18]. Many respondents indicated frustration with the process for establishing these business rules when they did not control many of the business functions. In other words, respondents felt like they were held responsible for costs and outcomes but they were not in control of critical functions that impact costs and outcomes.

It is clear that more needs to be investigated about the business models and strategies for online learning. The authors held an online workshop hosted by the Sloan Consortium in which many participants discussed many business issues that they had regarded as unique to their own individual institution. The compounding complexities of being in a relatively new field where rules and processes are being established plus the unique characteristics of individual institutions do seem to indicate that much more work needs to be done in this field to see if it is critical to be in control or establish a unified process for all those units involved in delivering online learning. During the seminar, nine additional case studies were shared with participants and are reprinted in this volume. The case studies include colleges that differed in their business models and shared strategies about either business planning, curriculum planning and student services.

It is clear that there is need for further guidance on how to manage business models in online learning.

VI. ABOUT THE AUTHORS

Karen Vignare currently serves as the Director of MSU Global Ventures at Michigan State University. In that role, Karen is responsible for creating online entrepreneurial approaches for extending both non-credit and credit programs at MSU. Before that, she was the Sr. Research Analyst for the Online Learning Department at the Rochester Institute of Technology. She also served in other roles at RIT in the Online Learning department. Before coming to RIT, Karen was a full-time faculty member at SUNY-Alfred State in the marketing, retail, and computer technology fields. She also served as a vice president and political economist for a Wall Street financial firm. She publishes regularly on various topics in online learning. She has an MBA from the University of Rochester’s William Simon School of Business and a BS from Frostburg State University in political science and economics. She is currently attending doctoral classes at Nova Southeastern University.
Dr. Christine Geith is director of Michigan State University's MSU Global, the university's entrepreneurial business unit that works with academic partners across the campus and worldwide to develop and market online institutes, programs and services. She is responsible for developing strategic frameworks and business models and leading all activities that impact revenue growth. This includes business development, alliances and partnerships, product development, marketing, sales and customer support. Dr. Geith’s research interests include costs, benchmarks and business models for online and blended learning. Dr. Geith has over fifteen years of experience in online learning including four years as director of MSU Global Ventures. Prior to joining MSU, Dr. Geith was executive director of e-learning at Rochester Institute of Technology. Dr. Geith holds an M.B.A. from Rochester Institute of Technology and a Ph.D. from the University of Nebraska-Lincoln.

Dr. Stephen Schiffman is currently Associate Professor of Entrepreneurship at both Babson College and the Franklin.W. Olin College of Engineering. At Babson, Steve was dean of the undergraduate program for 8 years while a new undergraduate business curriculum was developed and launched in the fall of 1996. In 1997, the Pew Charitable Trusts recognized this effort by selecting Babson for a Pew Leadership Award for renewal of undergraduate education. Steve holds a Ph.D. in mathematics from Dartmouth College as well as an M.S. in management from Sloan School, MIT. He has taught at the University of Colorado and Colorado College, and, prior to joining Babson College, he worked at Digital Equipment Corporation.

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VIII. REFERENCES

### IX. APPENDIX A

**Survey: Identification of Successful Business Practices for Online Learning**

1. **What is your Carnegie classification?** (A Carnegie classification is determined by the academic programs your institution offers, i.e. if your college offers mainly four-year general degrees your college is likely to be a Baccalaureate-General institution.)
   - Research Extensive (R-1) 27
   - Research Intensive (R-2) 13
   - Masters Extensive (M-1) 17
   - Masters Intensive (M-2) 14
   - Baccalaureate - Liberal Arts 9
   - Baccalaureate - General 16
   - Baccalaureate/Associates 2
   - Associates 22
   - Specialty 3
   - Did Not Answer 5

2. **Is your institution**
   - Public 88
   - Private 38
   - Did Not Answer 2

4. **Which business model best describes your current online learning operations?**
   - Independent unit that is self-funded 25
   - Independent unit that is overhead-funded 9
   - Independent unit that is for-profit 1
   - A college, department or school within the university which is self-funded 29
   - A college, department or school within the university which is overhead-funded 43
   - Other... 21
   - Did Not Answer 5

5. **What is the size of your online learning credit and non-credit enrollments (i.e. registrations, not heads) per year?**
   - Less than 500 enrollments 19
   - 501 to 1000 enrollments 18
   - 1001 to 5000 enrollments 38
   - 5001 to 10,000 enrollments 16
   - More than 10,000 enrollments 33
   - Other... 2
   - Did Not Answer 2

6. **What portion of the total enrollments referenced in the previous question is non-credit?**
   - 0% 68
   - 1–10% 49
   - 11–25% 4
### 7. What portion of the total enrollments referenced in question #5 are from your traditional on-campus students?

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>19</td>
</tr>
<tr>
<td>1–10%</td>
<td>20</td>
</tr>
<tr>
<td>11–25%</td>
<td>17</td>
</tr>
<tr>
<td>26–50%</td>
<td>24</td>
</tr>
<tr>
<td>51–75%</td>
<td>14</td>
</tr>
<tr>
<td>76–99%</td>
<td>27</td>
</tr>
<tr>
<td>100%</td>
<td>3</td>
</tr>
<tr>
<td>Did Not Answer</td>
<td>4</td>
</tr>
</tbody>
</table>

### 8. What is your best estimate of the percentage of your total enrollments which are online? (Include the online enrollments you mentioned previously.)

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 1%</td>
<td>9</td>
</tr>
<tr>
<td>1–5%</td>
<td>21</td>
</tr>
<tr>
<td>6–10%</td>
<td>37</td>
</tr>
<tr>
<td>11–20%</td>
<td>21</td>
</tr>
<tr>
<td>21–50%</td>
<td>18</td>
</tr>
<tr>
<td>More than 51%</td>
<td>14</td>
</tr>
<tr>
<td>Other...</td>
<td>3</td>
</tr>
<tr>
<td>Did Not Answer</td>
<td>5</td>
</tr>
</tbody>
</table>

### 9. What is the total number of online programs, certificates, and/or certifications offered at your institution?

<table>
<thead>
<tr>
<th>Number of Programs</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td>1–10</td>
<td>59</td>
</tr>
<tr>
<td>11–25</td>
<td>31</td>
</tr>
<tr>
<td>26–50</td>
<td>9</td>
</tr>
<tr>
<td>51–75</td>
<td>3</td>
</tr>
<tr>
<td>Greater than 75</td>
<td>7</td>
</tr>
<tr>
<td>Did Not Answer</td>
<td>1</td>
</tr>
</tbody>
</table>

### 10. What are the types of programs your institution offers online? (Check all that apply)

- Associate degrees: 22
- Bachelors degrees: 66
- Masters degrees: 72
- Doctoral degrees: 14
- Customized Corporate programs: 28
- Customized Government/Military programs: 13
- Credit bearing Certification/Certificate programs: 64
- Non-credit Certification/Certificate programs: 44
Please rate the following based on their importance to online learning in your organization

<table>
<thead>
<tr>
<th>Very Important</th>
<th>Important</th>
<th>Neutral</th>
<th>Only of minor importance</th>
<th>Not important</th>
<th>Not applicable</th>
<th>Did Not Answer</th>
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<tr>
<td>42</td>
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<td>16</td>
<td>9</td>
<td>9</td>
<td>3</td>
<td>11</td>
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<tr>
<td>54</td>
<td>35</td>
<td>16</td>
<td>5</td>
<td>3</td>
<td>13</td>
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<tr>
<td>17</td>
<td>43</td>
<td>18</td>
<td>18</td>
<td>15</td>
<td>15</td>
<td>13</td>
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<tr>
<td>22</td>
<td>30</td>
<td>18</td>
<td>12</td>
<td>6</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>31</td>
<td>64</td>
<td>19</td>
<td>6</td>
<td>5</td>
<td>2</td>
<td>15</td>
</tr>
</tbody>
</table>

11. Returning a surplus to the institution
12. Contributing to the extension efforts
13. Contribution to traditional on-campus student retention
14. Increasing diversity of student body
15. Enhancing value of university brand

17. What is your primary course-development and delivery model for credit programs?
   - Individual faculty or staff developing and delivering their own course: 70
   - Individual faculty or staff developing and multiple faculty delivering the same course: 18
   - Individual faculty or staff developing and other instructional staff delivering (i.e. adjuncts, graduate assistants): 6
   - Teams of faculty and staff developing and multiple faculty delivering: 16
   - Teams of faculty and staff developing and other instructional staff delivering (i.e. adjuncts, graduate assistants): 5
   - Other: 12
   - Did Not Answer: 1

18. Identify the function(s) below that are directly controlled by the unit with the primary responsibility for online learning. (Check all that apply.)
   - Business Planning: 82
   - Integrated Marketing Functions: 69
   - Price Setting: 44
   - Ability to enter partnerships: 69
   - Student services: 79
   - Technical support: 75
   - Quality control for the learning experience: 90
   - Retention for non-credit student/customers/clients: 34
   - Retention for students enrolled in credit bearing courses: 64
| Ability to remove products from the market | 54 |
| Ability to hire faculty/instructors | 47 |
| Ability to create new customized curriculum | 42 |
| Ability to create new non-credit curriculum | 50 |
| Ability to create new credit curriculum | 36 |
| Other... | 7 |
| Did Not Answer | 5 |
BUSINESS MODELS FOR ONLINE EDUCATION

George Lorenzo
Educational Pathways

ABSTRACT
Nine institutions—Colorado State University, Dallas County Community College District (DCCCD), Duquesne University, Georgia Institute of Technology, University of Central Florida, The University of Illinois at Springfield, University of Massachusetts Lowell, University of Michigan, University of Georgia—share information about their business models.

KEYWORDS
Targets of Opportunity, Self-sustaining, Course Development, Quality Assurance, Return on Investment, Responsibilities, Grant Proposal

I. COLORADO STATE UNIVERSITY

Location: Fort Collins, CO
Student Population: 27,973
Type of Institution: 4-year public and above (Land Grant)
Carnegie Classification: Doctoral/Research Universities—Extensive
Distance Education Unit:
  Continuing Education
  Self-Funded Independent
Websites:
  Colorado State Continuing Education: http://www.learn.colostate.edu
Based on Interviews with Al Powell, program director, certificates, online and independent learning and Debi Colbert, program director, distance degrees

Colorado State Division of Continuing Education (DCE) is a self-supporting unit that develops and delivers distance education degrees and certificate programs, credit and noncredit courses, and custom training for businesses and industry. DCE has been offering distance education since 1967 and adult education programs in Denver for more than 20 years. DCE currently serves about 13,000 students each year in both face-to-face and distance programs.

A. Targets of Opportunity
“We are still showing signs of developing a business model, but if you want to characterize ours, you can call it targets of opportunity,” says Al Powell. These targets can come from an outside entity, such as an industry in need of special training through a certificate program; internally from a department that identifies a need to provide access to more students, such as a water hydrology program that attracts an international audience; a state agency in need of employee training; or community college graduates
seeking four-year degrees. When such targets present themselves, “two things happen more or less simultaneously,” says Powell. “We start talking to the academic department involved, and we try to figure out a way to conduct market research that will tell us what the prospect for success really is for a program. We do not have a fixed format. We do develop a spreadsheet to predict the costs of development and delivering the program, as well as the projected revenues. Sometimes we do pay for development and other times we don’t.”

**B. Responsibilities of Academic Units and DCE**

The academic departments within the university initiate requests for courses to be converted, or developed from scratch, to the distance learning format and are fully responsible for course development. DCE helps with coordination efforts, providing suggestions on what may need to be included inside a curriculum based on their market research. However, sales and marketing are DCE’s two primary responsibilities, along with providing registration services to students.

Technical support is provided by the institution and quality control of course development is handled through the Office of Instructional Services, a university-wide organization responsible for providing media and instructional technology support for instruction, outreach, and other purposes for faculty, staff, and graduate teaching assistants.

The gathering of retention data is currently in a development phase. Overall quality control of courses and programs “is determined by the fact that we are a university and our faculty are teaching,” Powell explains. Beyond that, quality control, in terms of the way courses are conducted and the types of media used, is facilitated through a student-government-mandated survey that is an evaluative process. “The quality control measures tend to be more student-evaluation-based, with feedback to the faculty members and expectations that faculty want to do better every time around.”

The responsibility for hiring faculty also rests with the departments, but DCE does jump in. “I worked with several different departments to get adjunct faculty to teach courses; I have found faculty and received the department’s approval for these faculty to teach courses,” says Debi Colbert.

**C. Overall Structure of DCE**

DCE is comprised of 35 employees divided into six divisions: Enrollment Services, Online & Distance Learning, Denver Programs, Northern Colorado Programs, Administration, and Continuing Education Initiatives. Powell and Colbert fall under the Online & Distance Learning division. Director Rick Simpson oversees the entire DCE staff.

Program directors are responsible for various business units within each division. “Each program director has a chunk of business that they tend to specialize in, but we do move back and forth and support each other as needed,” notes Powell. For example, Powell happens to have an extensive background in agriculture, so he handles an Agriculture and Range Science distance degree program, which would normally fall under the purview of Colbert, who is distance degrees program director.

Program directors are also responsible for sales. “We double that way,” Powell explains. “As our programs grow, it is predictable that we will be hiring a direct sales staff.” Two years ago, however, DCE was forced to lay off two sales professionals and a marketing manager for fiscal reasons.
D. Non-Credit Offerings

DCE non-credit offerings are in a relatively large rebuilding phase. Historically DCE has offered a wide variety of non-credit distance education courses through outside vendors who supply a host of courses, ranging from bookkeeping and paralegal certification to graphic design and SAT/ACT preparation courses.

Recently DCE signed a contract with the state of Colorado to become the continuing-education-approved entity for all state employees, both at a distance and in face-to-face classes. Additionally, DCE will soon be offering reduced-priced, non-credit enrollment options inside many of its for-credit online offerings. “There are plenty of courses we offer that have value,” says Powell. “For instance, we have a four-credit greenhouse management course, and half of the people taking it are in the greenhouse industry. If we provide that as a non-credit course at a slightly reduced tuition rate, we think we will considerably increase enrollments and revenues.”

E. Fiscal Responsibilities

Under Colorado state law, most continuing education units operate as enterprise units that pay their own bills that are generated by tuition dollars. “The models vary,” says Powell, “but basically the way we pay our bills is when we enroll a student, that tuition is split between us and the department—or us, the instructor, and the department.”

DCE currently pays faculty an average of $3,000 to develop online courses. However, both Colbert and Powell say that there are many instances where faculty will come to them with a good portion of their course already converted to the online mode of delivery. These faculty typically do not seek any compensation, or they might need a relatively small amount of money in the $1,000 dollar range to pay for graduate student assistance to fine-tune their course to a fully online modality.

“We are getting close to having one kind of split,” adds Colbert. “Currently financial agreements with departments are a little scattered, but we have to pay our overhead to the university, and we have to make a certain amount of money to keep our doors open. However, we try to give the majority of the revenues back to the department.”

In general, the business model at DCE is one in which program directors run their own micro businesses and have a good deal of autonomy. Says Powell: “The director (Rick Simpson) delegates a great deal of authority to each one of the program directors. Rather than imposing a financial plan from the top, what he has done is told us that based on what our gross is, we know the percentage of overhead the university gets, and we know the percentage of overhead the administrative operations and continuing education get. For example, I have five different spreadsheets, and I can quote you percentages off any of them—one for the Agricultural Education degree I run, one for the Rangeland Ecology degree I run, etc. I have separate spreadsheets for online courses, correspondence courses and telecourses. So each program director knows exactly what their programs cost and knows exactly what percentage they are getting from any particular type of course. We all work under the directive that we bring these plans forward to the fiscal officer and the director. And every program that we have must be set up as a financially sustainable model.”
II. DALLAS COUNTY COMMUNITY COLLEGE DISTRICT (DCCCD)

Location: Dallas County, Texas
Student Population (7 colleges): 82,641
Type of Institution: 2-year public
Distance Education Unit:
   R. Jan LeCroy Center for Educational Telecommunications
   Self-Funded College
Websites:
   Dallas TeleLearning: http://telelearning.dcccd.edu/
   Dallas TeleCollege: http://dallastelecollege.dcccd.edu

Based on Interview with Pamela Quinn, Assistant Chancellor, DCCCD and President, LeCroy Center

About 80 people from the LeCroy Center for Educational Telecommunications are responsible for running two organizations—Dallas TeleLearning and Dallas TeleCollege—that provide distance education courses, programs and services through the Dallas County Community College District (DCCCD).

The entire operation is self-sustaining. “The LeCroy Center does not receive tax dollars directly like a college; we have to be entrepreneurial to exist,” says Quinn.

A. Dallas TeleLearning

The birth of Dallas TeleLearning came in 1972 when DCCCD produced an American Government telecourse that enrolled 399 students. Today, Dallas TeleLearning has grown into one of the leading suppliers of programming for the Public Broadcast System (PBS) Adult Learning Service, and more. In excess of 40,000 students enroll in telecourses through PBS each semester. However, Quinn explained that PBS Adult Learning Service is dissolving at the end of September 2005, and the LeCroy Center is diversifying its products and services to meet market demands on a variety of different fronts. In addition to being used by the DCCCD’s seven colleges, Dallas TeleLearning courses, which can be delivered on broadcast and cable television, on CD-ROM and DVD, or as streaming video, are leased on an annual fee basis to institutions across the country.

Dallas TeleLearning courses are by no means ordinary. These are extremely sophisticated interactive video and computer-based productions that can cost up to $1.5 million each to produce. “We have had a very large penetration with up to 1,200 different colleges and universities using our product over the years,” says Quinn. “Probably 60% of those colleges are two-year schools, and 40% are four-year schools.”

TeleLearning courses are primarily college credit-bearing, transfer courses in the general education area. “We know what the most popular courses are across the country that all freshmen and sophomores are taking. That is the market we have gone after—everything from English to business to history and health and nutrition,” says Quinn.
“The business plan we use for course development is very high end and detailed, with the end result being a product that can be used by a lot of institutions and then scalable within an institution. Multiple faculty can teach the same course.”

**B. How Telecourses are Produced**

Faculty course developers are typically hired from within the DCCCD. They serve as content experts for two years but do not appear in the videos. These faculty go on leave from their home colleges and are paid their same annual salaries by Dallas TeleLearning.

Courses are developed and produced by a team of script writers, producers, programmers, and instructional designers. “We interview the best professors all across the country on whatever the topic is,” says Quinn. “The faculty member is working with script writers to develop the script (they also write a student guide for the course). When we are producing these video tapes, our crews are literally flying around the country. If we are interviewing someone who is an expert on the Civil War and they are based at the University of Tennessee, then we go to the University of Tennessee.”

The courses are made up of documentaries, professional interviews and narration, along with interactive learning activities. A textbook is also included in the package. “We partner with major publishers in the development of the course,” says Quinn. A standardized, well-known textbook typically supplements the video. The two year course production cycle starts with the planning out of course content creation and a production schedule over the first nine months. The next nine months are the actual production of the course, and the remaining six months are used for editing and pulling everything together into a final product.

The academic integrity of the Dallas TeleLearning courses starts with a curriculum committee that is developed for every course which approves every phase of the production cycle and ensures that academic objectives are met. Plus Dallas TeleLearning has a national advisory committee comprised of faculty members from around the country who meet twice each year in Dallas. “They fly in and our team here goes over everything with them, and we get feedback and input into whether or not we are doing the right thing, or if we need to change anything,” says Quinn.

Dallas TeleLearning is also responsible for marketing and leasing these courses through its business and marketing departments.

**C. Win-Win**

The DCCCD college that loans out its professor for two years gets the course at no charge to offer to their students. “We work collaboratively,” adds Quinn. “They get credit for everything we create, so the benefit goes back to the college. Also, for an experienced faculty member who has spent years in the classroom, this two-year assignment provides a wonderful way for them to update their knowledge and meet some of the key academicians in their field. They travel, and they get rejuvenated. Our colleges totally support that because it is such a great staff development program for them as well, since these faculty members return to the colleges as better classroom teachers.”
D. Dallas TeleCollege
The Dallas TeleCollege is an entirely different operation that also comes under Quinn’s authority. The staff at the LeCroy Center for Educational Telecommunications is responsible for recruiting students to the online virtual campus of the DCCCD. Any course delivered through the Dallas TeleCollege is the equivalent of the same course taught on campus. All courses appear on an official transcript as being offered by one of the seven accredited DCCCD colleges.

In addition to recruiting students to the TeleCollege, a support staff at the LeCroy Center is responsible for the entire district’s online registration help desk, as well as for providing technical support to both on-campus and online students and faculty.

All tuition dollars generated by the Dallas TeleCollege go to the TeleCollege. “We keep all the tuition,” says Quinn. “It is a special formula that our system has allowed us to develop. They did not put us into the normal funding formula that our campuses are in, so we came up with something a little different. It is an internal process that puts us more on the entrepreneurial side. When you enroll students, you get money; when you don’t enroll students, you don’t get money.”

The seven colleges get the contact hours that are generated from TeleCollege students, which are, in turn, reported to the state for state-funding purposes.

“We recruit locally and nationally to bring in students to add to the enrollment base,” adds Quinn. “We reach out. We have had students enroll in the TeleCollege from all 50 states, and we have students who have enrolled from five continents. So we really have reached out on a worldwide basis, and that is where we are generating new enrollments for our colleges—plus we have a lot of [on-campus] students who are taking distance learning courses.”

E. Other Revenue Streams
In addition to the many district-wide distance learning administration, technology infrastructure and instructional support service functions housed at the LeCroy Center for Educational Telecommunications, the Center also provides educational institutions, business and industry, and governmental agencies with a variety of contractual support services. These include leasing of conference rooms; downlinking of teleconferences; leasing of production facilities, use of instructional design and production staffing; delivery of educational programs by microwave and satellite; and educational telecommunication consulting services.

“I don’t want to be dependent on one revenue stream,” says Quinn. “So we continually look for new ways to support our students and colleges. And, of course, we are non-profit, and any additional revenue goes into our fund balance, which allows us to create courses and products when we see the need.”
III. DUQUESNE UNIVERSITY

Location: Pittsburgh, PA
Student Population: 9,722
Type of Institution: 4-year private, not-for-profit
Carnegie Classification: Doctoral/Research Universities—Intensive
Distance Education Unit:
   School of Leadership and Professional Advancement
   Self-Funded College
Website:
   School of Leadership and Professional Advancement: http://www.leadership.duq.edu/
Based on Interviews with Kelley Maloney, Director of Marketing and Communication, School of Leadership and Professional Advancement (SLPA); Ben Hodes, Dean of SLPA; and Boris Vilic, Director of Technology for SLPA

Duquesne University’s School of Leadership and Professional Advancement (SLPA) is one of 10 schools at the university. It was formerly the Division of Continuing Education. SLPA offered its first online courses in 1996. Its first fully online degree program, a master’s in Leadership and Liberal Studies, was launched in 1999. SLPA now delivers an undergraduate degree (several concentrations), one graduate certificate, and five graduate degrees online. Approximately one-third of SLPA students are now earning their degrees entirely online.

A. How Programs Get Started
In terms of how programs are developed and launched, SLPA conducts in-depth research with industry professionals to determine a program’s viability. For example, “We started a bachelor’s degree in Humane Leadership in conjunction with the Humane Society of the United States, and we worked with them to develop the curriculum and make sure it worked for their target population,” says Maloney. The program is designed for individuals working in animal care and control facilities across the United States and is intended to provide targeted, specific knowledge that will support their career goals in animal advocacy and shelter management.

For another new degree program, a new master’s in Sports Leadership, SLPA conducted focus groups and gathered information from sports professionals and managers. They discovered a need for educational opportunities for those working in the professional sports industry to build skills in handling ethical and legal matters, strategic marketing issues, and leadership training for contemporary sports challenges.

“Before we can offer a program, it has to go through our academic council, which is comprised of all the deans, the provosts, the librarian, the IT director, all the major academic players on the campus,” says Vilic. “They look at the program and determine if it is feasible or not feasible and if it should be housed in our school or not in our school. Once the academic council grants approval for the program, we sometimes have to go to the state for approval, and we also have to work with our budgeting office to make sure that the program gets funded. There are steps for both the academic council and budget management side that we have to accomplish to make sure we get the requisite funds to start the program.”
Hodes explains that programs start through “a very serious balancing act between the political environment in the university, the mission of the university, our strengths, our capacity, and what market needs exist. When it comes to new program development, some universities stumble and have to make a lot of sacrifices, and it compromises their effectiveness in the market. We are fortunate. We run much more like a business.

“On the program development side, there is not a lot of response lag time; while we are very thorough in curriculum development, there is not an extensive curriculum committee review; a lot of it is juggling and getting ideas that can fit in amidst all those variables. We have been very lucky in the sense that we have had far more success than we have had failures. We also believe that in order for it to ultimately succeed in the market, it has to succeed academically. So, there is far more attention being paid, although it is in the early stages, to learning outcomes. Also one of the dimensions that is often overlooked in distance learning is this whole issue of customer service. How do you serve a population that can’t come into your office? There are a lot more difficult challenges to delivering customer service.”

B. Quality Assurance

To help guarantee a high quality online teaching and learning experience, SLPA uses a faculty evaluation instrument called the Teaching Effectiveness Questionnaire (TEQ). Instructors at Duquesne University are required to have their students provide feedback on their teaching through the TEQ. It is administered near the end of the semester by a staff member, not the course instructor. The responses are anonymous, and they are not available to the instructor until well after the course grades have been submitted. In addition, Noel Levitz conducts student satisfaction surveys for SLPA. “We try to get as much feedback as we can directly from the customer. And more important, we try to act on the issues that arise,” says Hodes.

Team leaders within disciplines are responsible for working with faculty to make sure that the quality is where it needs to be academically, and an assistant dean of academic programs gets involved with any quality issues on a day-to-day basis. Team leaders also advise students in matters related to credit transfer and other issues—“the typical department chair responsibilities,” says Vilic, who serves as team leader for technology courses. They are also responsible for course staffing, which includes identifying prospective faculty members. “Once I identify them, I have to get them approved by the assistant dean and the dean,” he adds.

Additionally, SLPA recently started a new online faculty support service called “eCoach.” Here Rita Marie Conrad and Judith V. Boettcher—national experts in the area of instructional design and online teaching—are available to answer any questions a faculty member might have regarding online instruction in SLPA.

Faculty must also live up to a contract and online teaching standards “to really accommodate the unique needs of our students,” says Vilic. For example, online faculty must respond to students within 48 hours, post at least four substantive messages each week, and grade students’ work in a timely and effective fashion. “We have been doing this for a long time and have data on what works and does not work online,” Vilic adds.

About 50% percent of the faculty who teach in the SLPA programs come from the other schools on campus, and some are team leaders. These full-time Duquesne faculty teach classes on an overload basis unless otherwise assigned by their department chairs. The rest of the faculty are adjuncts who are
professionals in their chosen fields. Faculty are also given a “small stipend” to develop new online courses.

C. Fiscal Feasibility
Vilic adds that every new program is evaluated for fiscal feasibility after three years, and to be financially feasible means that there is some profit from the program—it cannot be generating losses.

IV. GEORGIA INSTITUTE OF TECHNOLOGY

Location: Atlanta, GA
Student Population: 16,841
Type of Institution: 4-year public
Carnegie Classification: Doctoral/Research Universities—Extensive
Distance Education Unit:
Georgia Institute of Technology Distance Learning & Professional Education
Self-Funded Independent
Websites:
Georgia Institute of Technology Distance Learning & Professional Education:
http://www.cdl.gatech.edu
The Global Learning & Conference Center at Technology Square:
http://www.glcc.gatech.edu/

Based on Interview with William Wepfer, Vice-Provost for Distance Learning & Professional Education & Professor of Mechanical Engineering

The Georgia Institute of Technology (GIT) Distance Learning & Professional Education (DLPE) is housed in GIT’s new Global Learning & Conference Center (GLCC) at Technology Square, a facility that features over 32,000 square feet of high-tech meeting space, including a wireless environment and the ability to send and receive programs worldwide from any of the conference center’s 27 meeting rooms.

DLPE consists of four programmatic areas: distance-learning, professional education, the Language Institute, and conferencing and space rentals within the GLCC. DLPE’s distance education offerings include seven graduate degree programs in engineering and a master’s in Medical Physics (jointly with Emory University). A College of Architecture Building Construction master’s program at a distance will be launched in January 2006.

Georgia Tech began providing distance-delivered master’s degree programs in 1977 in response to the needs of local employers. The first three degrees offered were in electrical, mechanical, and aerospace engineering. The course content was captured via video cameras and shipped via video tapes and thus our heritage is rooted in the TV broadcast culture, says Wepfer. The other programs (industrial engineering, civil engineering, environmental engineering, and operations research) have been added in distance format beginning in the early 1990s. Medical Physics began as a distance-delivered Health Physics degree in the 1980s and was recently reconfigured to meet the needs of a newly-emerging field.
GIT also offers a good number of non-credit professional education and personal enrichment courses both on campus at its Global Learning & Conference Center and off-site at locations throughout the US. DLPE is “starting to dabble in” the distance-delivery of such continuing education courses,” says Wepfer.

DLPE is also the home of GIT’s Language Institute, a successful on-campus English as a Second Language program that is beginning to develop two online courses on written business communication and accent reduction.

“I am a business unit that has to come out in the black,” says Wepfer.

A. Delivery Format

Off-campus students can choose from video classes, Internet courses (mechanical engineering and electrical and computer engineering), or classes in a combination of the two formats.

Video cameras record faculty lectures and student-faculty interaction during regular 15-week (semester) graduate classes. The videotapes, CD-ROMs or DVDs, and supporting course materials are sent to off-campus students for viewing. Students interact with faculty via telephone, fax, and electronic mail. Student-to-student and student-to-faculty interaction occurs using bulletin boards and the threaded discussion capabilities of WebCT.

B. Building a Better Backend

DLPE is currently in a transition and infrastructure-building phase to better manage its growth. “We are in the process of converting our entire operations—credit and non-credit,” says Wepfer. This includes going live with a new SunGuard Banner enterprise system by this coming winter, followed by a redesign of its website. I want to get the architecture of the system right within the university’s database system, and then, assuming the Banner conversion goes well, we will start to revise our web interface to integrate more marketing and an easier-to-use interface.”

Additionally, coming from a heritage of videotaped lectures, DLPE recently converted to streaming media this fall. All captured course content is now available via Video on Demand (VoD). DLPE also adopted fax server technology to replace its outdated fax paper transmission processes.

DLPE also provides streaming media capture and support for course content exchanged between the Atlanta and Savannah campuses for four undergraduate engineering programs. This is all done synchronously via high-bandwidth Internet connectivity.

C. Responsibilities

Most of the courses offered by DLPE consist of video-taped on-campus live courses put inside the WebCT course management system. Other courses consist of lecture modules taped in a studio. DLPE is responsible for capturing, coding, digitizing and archiving these live courses and modules. “We are the students’ arms and legs,” says Wepfer. “The other thing we do is provide the academic units with marketing assistance. On the non-credit side, this is absolutely essential. On the credit side, you always have a dialogue with the academic units. They think they know everything about marketing, so you have to sort of finesse that a little bit.”
DLPE is also involved with business planning and the gathering of market survey data.

D. Business Planning and Business Model
“We have to be involved in business planning and providing market survey data,” says Wepfer. Any program that wants to go online has to submit a request-for-approval to the State Board of Regents of the University of Georgia System. In addition to filling out rudimentary forms for the Board, Wepfer has recently started to incorporate a version of the Michigan State University Office of MSU Global’s Business Planning and Costing Model (BPCM) that is used for the development and implementation of online degree and certificate programs. The BPCM is comprised of five templates and a Program Costing Model (PCM) that have been developed since MSU Global was established in 2000. The templates help to streamline the entire online degree/certificate planning, development and implementation process. (See the Sloan-C Effective Practice “Business Planning and Costing Model Streamlines Development and Implementation Process” at http://www.sloan-c.org/effective/details5.asp?CE_ID=59.)

E. Becoming More Proactive
Although DLPE does not get heavily involved with curriculum development, Wepfer said he is trying to get his unit to be “very proactive. The legacy of this unit is that we were reactive. We are not doing that anymore.” The adoption of the MSU BPCM will help “develop protocols, so as units come to us, they will have a clear set of expectations of what we need, and what they need to do, and what needs to happen to make a program work.”

GIT does have a Center for the Enhancement of Teaching and Learning (CETL) that provides instructional technologies and designers for the development of distance courses. “When we partner with units, we try to point out to them how critical it is to have an instructional designer, and we do everything we can to get them to involve CETL.” Wepfer says that his unit currently pays for CETL services, but he predicts DLPE will eventually hire its own instructional design staff in the future.

In relation to monitoring learning effectiveness, “we have an awful lot of input on the technical quality of what goes out,” says Wepfer. As a Vice Provost; Wepfer reports to the Provost. In addition, Wepfer is a member of the Georgia Tech Council for Institutional and Academic Program Review and Accreditation. “That carries some weight,” he adds. “We don’t micro manage what is going on in the classroom, but student and customer services are critically important. If there is a problem, my office hears about it . . . We also look at the course evaluations on the academic side, so we try to sort of do the bully pulpit.”

F. Financial Considerations
DLPE keeps 79% of the tuition revenue generated by the distance degree programs. The remaining 21% gets returned to the units, and most of that money filters back to the faculty as non-compensatory discretionary money. “The faculty members get some tangible benefit in recognition that it is an additional work load,” says Wepfer. “We have some courses that might have 40 students on campus and another 15 or 20 at a distance. We have some faculty members in some of those units pounding on our door. They want to do distance courses partly because they like to do it, but they also like it because they get some discretionary money for traveling to conferences, or to hire grad students, or to buy some equipment. I have one mechanical engineering colleague that has about 20 distance learning students and she will get about $7,500 in extra revenue to spend on her program. For our faculty this is an appropriate incentive that works.”
Wepfer also points out that the DLPE tries to obtain investment money for putting courses and programs online. For instance Sloan-C awarded GIT a grant (matched by the University System of Georgia) to put its Mechanical Engineering program online.

“The other thing I am challenged with is the new building [GLCC], and so I have to generate $2.5 million per year to pay debt service,” says Wepfer. “I am contributing a fraction that has been growing each year we have been in the facility. In the past, I did not have to pay debt service, and I would use a lot of that money for investment in new programs. So right now I am investment dry. I can make some, but I have to be very selective in terms of what I invest in.”

V. UNIVERSITY OF MASSACHUSETTTS LOWELL

Location: Lowell, MA  
Student Population: 11,089  
Type of Institution: 4-year public and above  
Carnegie Classification: Doctoral/Research Universities—Intensive  
Distance Education Unit:  
   Division of Continuing Studies & Corporate Education  
   Self Funded Independent  
Websites:  
   UMass Lowell Continuing Studies & Corporate Education: http://continuinged.uml.edu/  
   UMass Online: http://www.umassonline.net/  
Based on Interview with Jacqueline Moloney, Dean of Continuing Studies and Corporate Education  

With more than 65 years of service to adult learners, primarily in Massachusetts and New Hampshire, UMass Lowell’s Division of Continuing Studies & Corporate Education (CSCE) serves one of the largest student populations in northern New England, receiving approximately 20,000 enrollments annually. Nine years ago, the division started to offer online courses, beginning with four courses that were not part of any degree or certificate program. Today, it offers four fully online undergraduate degrees, five fully online graduate degrees, and 14 fully online undergraduate and graduate certificate programs.

A. Disciplined and Rigorous Business Plan Approach

In Massachusetts, continuing education must be self supporting and operate at no cost to the commonwealth. “We have to account for, in an audit sense, all of our expenses, including overhead and reimbursement to the campus,” says Moloney. So the division’s business model, which was set up during its early years and developed over time, revolves around a business plan approach that includes the development costs of online programs, forecasts on what these programs should generate in revenue, and calculations with regard to when and how much return on investment ought to be realized.

Moloney calls her business plan approach “very disciplined. We go through a pretty rigorous process. We meet with the departments and deans, and we come up with a business plan for each program, which I submit to the Chancellor as part of my annual budget and strategic plan. Included in that plan is our cost for developing courses, new markets, and money needed by the department to support the initiative. For
example, we will often include the cost for teaching assistants and clerical assistance. In one or two cases we have even supported faculty lines.”

B. Responsibilities

In addition to business planning, CSCE is responsible for course development, faculty support and development, front-line technical support for students, and program-specific marketing plans and services. It is also part of UMass Online, the University of Massachusetts system’s (Amherst, Boston, Dartmouth and Lowell) portal to online programs. The Division of Continuing Education & Corporate Education pays a 10% assessment out of its gross revenues to participate in UMass Online.

Another part of the financial formula includes paying for People Soft software as part of the division’s overhead. Moloney added that she works with the university’s Office of Enrollment Services, meeting with them once a month to review the impact of any decisions related to online student services.

CSCE is also responsible for price setting. “We have some capacity to do market-driven tuition setting,” Moloney said, “but generally we try to keep it consistent with what the state-supported programs charge for tuition. That is set by the state legislature and is a function of what they and the board of trustees think is affordable.”

When talking about the level of control CSCE has over the hiring of faculty and the sustaining of learning effectiveness and overall program quality, Moloney said that final decisions are made more jointly than in the past between the academic units and the Division of Continuing Education & Corporate Education executive staff.

C. Successful Example

With regard to program development and business planning, in general, Moloney points to an online master’s degree program in Education Administration that was launched in the fall of 2002 as an example of how the processes work, although there are different models that can be used, depending on the program under development. “They [the on-campus master’s in Education Administration program] had failing enrollments, and I had been talking to them about moving the program online,” Moloney explains. “Our team here of marketing people, course development people, and curriculum experts met with graduate school of education faculty and the dean. We had planning sessions with up to 25 people participating in these sessions. We reviewed everything from program development to the targeted audience. We developed a five-year budget, projecting costs, growth revenues and tuition.”

In calculating gross revenue, the formula was based on the program starting with 75 to 100 students at a growth rate of 25% for five years. The tuition was calculated at $1,000 per year, and the direct costs of instruction, marketing, and course development was calculated at $10,000 per course plus an overhead charge for continuing education to provide all the student services. (This year all continuing-education-managed student services were transferred over to the institutional level. “We developed this cutting edge response system for students; they took our staff and our automated services and collapsed them into the day school,” says Moloney.)

“We also factored in the department’s cost for engaging in this activity, depending on the department’s needs, [i.e., they might need a teaching assistant to field inquiries from prospective students],” says Moloney.
Ultimately the master’s in Education Administration program was modeled after the university’s on-campus degree program, which is designed around the frameworks required for earning Massachusetts state certification for principals, assistant principals, supervisors, and/or directors. Initially there were some tentative feelings about whether or not the program would succeed. There are a significant number of competing schools and colleges of education in Massachusetts offering master’s degrees. However, “from the beginning we have not only sold almost every class we have offered, but in many cases we have had to add extra sections,” says Moloney.

Tuition and fees are affordable, based on in-state tuition rates. Student enrollment is capped at 22 per class to encourage maximum student-instructor interaction, and technology support for novice online learners was ensured. The Graduate School of Education (GSOE) benefited by receiving funding from net revenues for teaching assistants, clerical support and adjuncts. As a result of the success in this program, the GSOE has launched 3 new graduate online degrees in high demand areas.

During the program’s first year of operation, approximately 300 students, about 75% of whom were already enrolled in the on-campus program, took online courses. “We have had very high levels of satisfaction and high return rates,” says Moloney. “We have students who are enrolled in this program who are ten miles away and never came to school here” because they could not fit face-to-face classes inside their already busy schedules. In addition to increasing enrollments, GSOE has increased the number of graduates from this program, from a low of 7–10 per year to a graduating class of 26 last year.

Another innovative feature of this program has been the faculty’s deep involvement in planning and development. The Deans of GSOE and CSCE; the faculty; and a team of course developers, program developers and marketing specialists from CSCE; meet regularly to discuss progress towards benchmarks based on Sloan-C’s 5 pillars. This process created a feedback loop on the quality of all aspects of the program that resulted in outstanding evaluations by faculty and students and provided an excellent model for building collaboration between academic programs and continuing education.

Online education has enabled this program to make leadership opportunities more accessible to larger numbers of highly qualified people; by nurturing, challenging and inspiring these candidates all within the online environment to fill some of the most demanding roles in our society. The program’s theme, “Education for Transformation,” has “gone live online.”

**D. About ROI**

With regard to return on investment formulas, Moloney says that the rule of thumb is to at least reach a break-even point by the end of any new program’s third year. Depending on the program, along with such factors as how the program fits in with UMass Lowell’s brand and mission, 15% above the break-even point after the third year is preferable, and “this is consistent with the goals that the Chancellor has set for continuing education,” adds Moloney. The master’s in Education Administration program reached its break-even point by the end of its second year of offerings.
VI. UNIVERSITY OF CENTRAL FLORIDA

Location: Orlando, FL
Current Student Population: 45,000
Type of Institution: 4-year public and above
Carnegie Classification: Doctoral/Research Universities—Intensive

Distance Education Units:
- Central Administration: Information Technologies and Resources
- Three primary units relative to distance education are:
  - Center for Distributed Learning
  - Course Development and Web Services
  - Research Initiative for Teaching Effectiveness
- Subsidized Service Unit—Overhead Funded

Websites:
- Online@UCF: http://online.ucf.edu
- Information Technologies and Resources: http://www.itr.ucf.edu/
- Center for Distributed Learning: http://online.ucf.edu/cdl/
- Course Development and Web Services: http://www.cdws.ucf.edu/
- Research Initiative for Teaching Effectiveness: http://pegasus.cc.ucf.edu/~rite/

Based on Interviews with Joel Hartman, vice president and CIO, Information Technologies and Resources and Steven Sorg, director of the Center for Distributed Learning

For the purpose of easy nomenclature, we refer to the combined primary units responsible for distance education at the University of Central Florida (UCF) as Online@UCF.

UCF is a rapidly expanding metropolitan research university in the growing city of Orlando. As campus growth continued at a rapid pace, UCF administrators realized, about 10 years ago, that effective growth and management of fully online programs and courses (what UCF calls “W” courses for Web-based), as well as the effective growth and management of blended courses (what UCF calls “M” courses for Mixed-Mode) could help infuse new teaching and learning efficiencies, as well as save on valuable physical space, well into the future.

A conversation with Hartman and Sorg reveals a mindset centered around the growth and management of providing an increased number of fully online programs and blended courses that ultimately have a considerable impact on the entire UCF campus. This impact, along with the strategic institutional planning it promotes, is backed up with solid data that has been collected and analyzed since UCF started offering distance education courses in 1996 to increase access opportunities for a specific group of students who were spread across the state.

Online@UCF engages more than 75% of the faculty and tens of thousands of students both on an off campus. Online@UCF offers 6 undergraduate degree completion programs, 9 graduate degree programs and 10 graduate certificates, plus 227 W courses and 142 M courses every semester from all academic areas. Online@UCF also offers extensive resources and support services for students over the Web.
A. An Activity of the Institution
Hartman describes Online@UCF as an “activity of the institution—not an activity of a piece of the institution. All of the academic colleges to a greater or lesser extent are offering online programs and/or blended learning courses. So, you can think about this as a fully integrated activity that coexists alongside face-to-face delivery, and that involves the same academic planning procedures, and the same kinds of goals and strategies, although they tend to be different with online because of unique opportunities. It is the same faculty and the same programs, in most cases. It is basically a core business of the institution.”

B. Where It All Starts and Grows
Online@UCF “coordinates program planning; internal and external relationships with colleges, departments and programs; accreditation; and policy as it relates to the academic side of this endeavor,” says Sorg. “To that end, we hold planning meetings with each of the college deans, the director of our regional campus system, and any others that are appropriate—all of whom have desires and needs that are in part fulfilled by having online courses, online programs, or blended courses.”

Each fall and spring term Online@UCF holds a meeting with the deans of all the UCF colleges, who invite their department chairs and any other administrators, such as assistant deans. According to Sorg, these two meetings address what various departments need to develop online courses and programs. “It starts with these meetings, and then there is a lot of activity in the background that I conduct with them, trying to elicit information that will help with planning,” says Sorg. Planning includes establishing a timeline for online support, coordinating with the program itself and the department chair which faculty members are going to need online course development support and training, and when the program is estimated to go online so that students can enroll. An optional promotional service that includes the production of brochures is also provided by Online@UCF to help the departments recruit students.

C. Not a Business Planning Model
Overall, Online@UCF does not operate under any business models, per se. “It is more of a planning process,” says Sorg. “They [colleges or departments] contact me or get referred to me and I initiate the process of clarifying what it is they want to do, for whom, what’s the time frame, what are the courses involved, who are the faculty—and then we try to get them into the queue (for training and course development) so that their goals, plans and timelines are met by our support services.”

Financial incentives to individual faculty members to conduct their course development work are provided in the form of a $2,000 stipend or a one-course release from their teaching assignment during the term that they are going through faculty development. They are also given new notebook computers if they are full-time faculty members. If they are essential adjuncts needed to deliver the program, they are provided with the stipend alone.

D. Other Meetings
Two more regularly scheduled meetings drive the development of online and blended learning environments at UCF on a continuous basis. One is a monthly meeting of a Distributed Learning Advisory Group that consists of the lead Online@UCF staff, the Vice Provost of the UCF regional campus system, the Dean of Graduate Studies and the Dean of Undergraduate Studies. Additional staff from across campus, such as the Continuing Education Department, are invited each month. Recent discussions, for instance, have revolved around providing more general education courses online to
reduce bottlenecks in various courses.

Another is a weekly meeting of an Enrollment Management and Planning Group, which is a broader group consisting of the aforementioned educators as well as staff from the Admissions Office, the Registrar’s Office, Institutional Research and Planning, and other offices and departments across campus. “We talk about how to manage the growth we have at this university, including online learning as one of the key strategies for managing and planning growth,” says Sorg. “We think we have turned the corner here. While it [online learning] has always been in the back of people’s minds, it is now right up front.”

E. Collecting Data

In addition, Hartman stresses how Online@UCF has, since its inception, consistently collected data and generated reports based on that data in order to address important issues, questions and concerns related to any online learning initiatives. “Our motto is lacking data, anecdote wins,” he says. In other words, isolated incidents that people have experienced, seen or heard can often grow into perceived truths that typically are not accurate. Therefore, you have to collect a large enough sample of data over a long enough period of time to offset inaccuracies and prove or explain real trends and developments.

For example, Sorg and his staff at the Center for Distributed Learning, with the help of the Research Initiative for Teaching Effectiveness, are responsible for producing a reliable bank of information based on facts that can ultimately paint an accurate picture of the true scope and scale of UCF’s online learning initiatives. With that in mind, Sorg publishes a document titled “UCF Access, Quality and Efficiency through Online Learning,” which is a part of a report about what kind, how much and where online learning is happening at UCF. Each term this report is shared with the college deans and chairs. “The idea is to share with them a spreadsheet in which all of the productivity data for each college is broken down by the different instructional modalities—everything from face-to-face to fully online courses and all the variations in between,” says Sorg. “Since it is broken down by college, they can look and see in their own college what percentage of their activity is in certain modalities, what the productivity levels are, and where those productivities are being gained.”

A more specific example of how data collection and report production can address key issues and concerns was demonstrated by a project in which UCF’s Data Mining Program and the Research Initiative for Teaching Effectiveness collaborated on an analysis of 1.2 million student responses to course/instructor evaluations given over several years. These evaluations are comprised of 16 questions, eight developed by the state and eight developed by UCF. According to Hartman, UCF online faculty were concerned that these questions fit more closely to face-to-face courses than online. Plus, faculty who were novice online teachers, still learning to master teaching online, were concerned that they might get lower student evaluations than their face-to-face colleagues, and thus suffer the consequences. The analysis, however, proved that faculty who taught online were, on average, rated excellent 14% more frequently than faculty who taught face-to-face. Plus, all 16 survey items tracked identically for both face-to-face and online courses. Hartman adds that, overall, helping to achieve success requires “collecting an enormous amount of information about activities and using that information to both inform others and for continuous improvement. We have made a significant number of changes and adjustments along the way based on a variety of feedback that has helped the effort adapt and fit the institutional needs.”

F. What About Return On Investment?

The colleges receive support for their online courses in exactly the same manner as they do for face-to-
face courses. Because the overall institutional budget is tied to enrollment growth, there is great interest in accommodating student demand. Online@UCF has become a strategic resource for accommodating institutional growth.

Annual revenues from fully online students, inclusive of matriculation fees and state support, totaled more than $23.5 million for academic year 2004–2005. As a return on the university’s investment in online learning support resources, this represents an ROI of approximately ten-to-one. In addition, the cost of brick and mortar construction that has been avoided due to fully online and blended learning courses exceeds $4.5 million.

VII. THE UNIVERSITY OF ILLINOIS AT SPRINGFIELD

Location: Springfield, Illinois  
Student Population: 4,396  
Type of Institution: 4-year public  
Carnegie Classification: Master’s Colleges and Universities I  
Online Unit:  
Office of Technology-Enhanced Learning (OTEL)  
Subsidized Service Unit - Overhead Funded  
Websites:  
UIS Online: http://otelportal.uis.edu/  
Based on Interviews with Ray Schroeder, Director of OTEL and Shari McCurdy, Associate Director of OTEL

The University of Illinois at Springfield’s (UIS) Office of Technology-Enhanced Learning (OTEL) began in 1997 with a grant from the University of Illinois system (comprised of three campuses: Chicago, Urbana-Champaign and Springfield) for the purpose of catalyzing the delivery of online learning. In addition to being supported institutionally through state appropriations, which have decreased in recent years, UIS OTEL has received more than $3 million in grants since its inception, with the majority coming from Sloan-C (see listing of grants at http://online.uis.edu/info—click on “Grants” in right column). For example, it recently was awarded $1.2 million from Sloan-C, matched with $400,000 from the University of Illinois system president’s office, to deliver eight new online degree programs.

In the fall of 1998, OTEL started to officially launch online courses through UIS Online, which is a part of the University of Illinois Online (http://www.online.uillinois.edu/) support system and a central source for information regarding the online degree programs, online courses and public service activities offered by the three University of Illinois campuses. UIS Online has grown enrollments by approximately 30% each year since it started. UIS Online currently offers six fully online undergraduate degrees, three fully online graduate degrees, and two fully online certificate programs. Five additional degree programs have been approved and are being developed.

Along with these programs, UIS offers individual for-credit online courses and the U of I Online Making the Virtual Classroom a Reality (MVCR) classes. MVCR courses are designed to assist faculty who wish to move their classrooms online. UIS also participates in the Illinois Virtual Campus, an electronic
catalog of online and distance learning courses available from nearly 40 colleges and universities in Illinois.

UIS Online does not offer any non-credit courses. OTEL’s mission revolves around providing a host of services to UIS faculty, including pedagogical training; technological training; research and course-delivery support. It also assists programs in moving curricula from campus-based to online delivery. Additionally, OTEL is responsible for investigating and acquiring software licenses that support its online learning efforts.

A. Technology Fee
To facilitate a continuous source of funding for OTEL, the UIS administration implemented a technology fee for all online courses. This fee, which is plowed back into online learning, has grown from $15 per credit hour to $25 per credit hour. Thirty percent of the technology fee ($7.50) goes directly to OTEL. With approximately 2,700 enrollments this fall 2005 semester taking on average of 3.7 credit hours each, about $75,000 from the technology fee will be generated for OTEL in one semester. This money is used to help defray the cost of software licensing fees. For example, in addition to funding Blackboard, OTEL supports such software as Turnitln, Eluminate, and WebBoard. In addition, the fees help fund faculty development and support services for online students.

“I am a born-again believer in the idea of per-unit fees, because as the programs scale, your revenues scale, as well as your costs,” says Schroeder, referring to the increased cost of software.

B. How Programs are Started
Since all UIS programs begin primarily through grant funding, UIS uses an RFP process to solicit its 40 departments that may want to move a program(s) online (see “Grant Proposal Development Guidelines” below).

“In each case we develop a business plan; it is really a simple process,” says Schroeder. “How many students are you going to have? How is your program going to scale up, etc.? The decisions are made on the best demonstrated need and business plan. We normally map out four years, and we try to get a 100% cost recovery for the salaries of faculty members and for a program coordinator.”

Faculty are paid $6,000 off-load to develop an online course. These faculty then teach these same courses on-load.

The UIS Provost is the final decision-maker as to whether or not a program ultimately goes online. This decision-making process is aided by recommendations made by an academic cabinet comprised of academic deans. Schroeder also contributes his input into this process when necessary.

C. Program Coordinators
The program coordinator is a half-time professional who serves as a basic front-gate admissions advisor who points prospective online students to the appropriate institutionally provided student services, such as registration and financial aid services, that will ultimately get them enrolled in a program. “The bulk of student services and support go through the program coordinator, and it just naturally flows that way because that is the first person they talk to,” says McCurdy. “The program coordinators are the reason
why students come to UIS—because they give them personal attention and help them through the program.”

D. Tuition
One of the reasons why UIS has consistently experienced a 30% annual enrollment growth rate could be because out-of-state online students pay the same tuition as in-state online students, provided that they are accepted into a full program. They can’t take advantage of in-state tuition rates if they enroll in non-degree courses.

E. Who is Responsible for What
As aforementioned, OTEL primarily supports faculty training and course development. The unit also manages the tools necessary for online learning and encourages related research and scholarship. Academic units are responsible for curricular development, hiring faculty, learning effectiveness, evaluations, assessments, etc.—all managed the same as on-campus courses and programs.

The institution provides all the typical and necessary student services for students to get enrolled and stay in these programs from an administrative perspective. OTEL also offers support for such units as disability services and the center for teaching and learning with hardware, software and training to permit them to provide effective services to distant students.

F. Informal Network Maintains Integrity
UIS is a relatively small institution with an informal network that helps to maintain both academic and administrative quality. “We do a lot of informal things without direct line authority,” says Schroeder. “We are all about service and access. We serve the faculty; we serve the students; we work for them.” Schroeder is a veteran faculty member who has been teaching in the Illinois system since 1971. “I know what it is like to teach and what the faculty want, and that is the way you sell online learning to the on-campus people. You get the faculty excited about online learning at the grassroots. You don’t tell them you have to teach online, you get them to want to teach online.”

With regard to continuously maintaining the integrity of all UIS online programs, Schroeder says, “we have 200 some courses, and we usually hear early on from students when there are any problems in classes. If needed, I get involved with the students, then the faculty member, then the department head, then the dean. The primary mode of quality assessment is student evaluation. The very same evaluation used on campus, which is heavily weighted in the tenure and promotion process.”

G. Unfulfilled Potential
Finally if there are any serious issues, overall, at OTEL and UIS Online, it’s that they can’t keep pace with their potential growth. “It is amazing to me that we could have 10,000 enrollments this semester,” Schroeder claims. “We have 2,644 enrollments this morning, and that is without any substantial marketing. We are turning away people by not opening additional course sections. We simply are not scaling at the department level to meet the demand.”
H. Grant Proposal Development Guidelines

The proposal should begin with a description of the program to be delivered. Any differences between the scope of the program as it has been delivered on campus and the proposed online degree should be clearly identified. The use of instructional methods other than online (e.g. blended courses) should also be described. The remainder of the proposal should address issues of educational and economic viability. Suggestions for appropriate documentation are offered below:

1. Educational Viability

The educational viability of the proposals will be evaluated by program committees, the college curriculum committees, the graduate and undergraduate councils, and, if necessary, by the Senate itself under their existing procedures and criteria. The proposal should include formal approvals from the appropriate program and college committees.

In this case, we would ask that particular attention be paid to the following items:

- That the program has clearly stated student learning outcomes and appropriate mechanisms in place for their assessment. Evidence of prior success with the implementation of an effective assessment program would be significant.
- A detailed multiyear course schedule that will allow both new online and existing students to progress towards the degree in a timely fashion. The schedule needs to be adequate for the number of students anticipated and the program needs to be committed to its delivery.
- A detailed schedule for the development and deployment of the courses required in an online format. Evidence of the program’s commitment to online instruction would be helpful. A description of characteristics of the students the online program will serve. Admission criteria that will be used to select among applicants should be described.
- The extent to which arrangements have been made to provide courses required outside the major, if any.
- Issues of accreditation, if applicable. Is the program currently accredited? What will be the impact of online delivery on accreditation?
- Evidence that adequate plans have been made for advising and other support services required by the program’s students.

2. Economic Viability

Revenue

- Total enrollment and credit hour projections based on the rate at which students will be admitted, the assumptions made about retention and the rate of progress towards the degree.
- Projections for tuition and fees charged. A rationale for differential tuition, if proposed.
- Evidence of student demand for the online program, accompanied by enrollment history for the existing program and any prior online offerings, if applicable.
- Total revenue projections based on the information above.

3. Expenses

A budget for the one-time grant funds to include course development and other startup expenses. (Typically ten $6,000 course development stipends, plus $20,000 for staff support.)
An ongoing budget plan that would allow the program to be delivered indefinitely, to include:

- Projections for additional faculty required to support the multiyear course schedule as proposed for new online and existing students. Typically, new faculty would not teach entirely online, but rather would enable the program to share the responsibility for the new and existing offerings.
- Projections for support staff requirements and other operating budget requirements (e.g. equipment, marketing expenses, etc.).
- Projections for ongoing faculty development and curriculum development.

4. Other General Considerations

- The relationship of the proposal to UIS and/or IBHE priorities.
- Evidence of societal need, including employment prospects for graduates.
- Other materials as deemed appropriate by the proposing unit.

VIII. UNIVERSITY OF MICHIGAN

Location: Ann Arbor, MI
Student Population: 39,533
Type of Institution: 4-year public
Carnegie Classification: Doctoral/Research Universities—Extensive
Distance Education Unit:
  Michigan Engineering Center for Professional Development
  Self-Funded, College
Websites:
  Michigan Engineering Center for Professional Development: http://cpd.engin.umich.edu/
  Interdisciplinary Professional Programs: http://interpro.engin.umich.edu/
Based on Interview with Ed Borbely, Director, Michigan Engineering Center for Professional Development

The University of Michigan College of Engineering has a history of offering distance education courses dating back to the late 1960s when it delivered distance-education courses synchronously to remote locations via a microwave TV transmission system.

Today the University of Michigan Engineering Center for Professional Development (CPD), in partnership with a relatively new Interdisciplinary Professional Programs Office (InterPro) that was created two years ago, offers two fully online graduate degrees and courses toward three others: in Global Automotive and Manufacturing Engineering, Automotive Engineering, Integrated Microsystems, Pharmaceutical Engineering, and Manufacturing Engineering, as well as a graduate-level Lean Six Sigma Professional Certification Program. These credit-bearing programs, combined, enroll about 400 off-campus students, and growing. Another 400 on-campus students have the option of enrolling in these courses at their own discretion.
CPD also delivers a good number of non-credit engineering professional-development “short courses,” and certification programs that generate on average about 4,000 enrollments (not unique head counts) annually.

The for-credit graduate programs and the non-credit professional-development courses and certification programs are managed within two distinctly different business models.

A. For-Credit Fully Online Graduate Programs
The business planning for fully online credit-bearing graduate programs is rooted in an activities-based costing model implemented at the college level, says Borbely. “Costs have been estimated right down to the semester-credit level. Our distance-learning costs are a component of the tuition charged.” Bottom-line is that, for the purposes of this costing model, CPD’s break-even point comes at 2,400 credit hours each year. “That is across all of the credit courses we deliver,” says Borbely. “After that, we are in a mode where there is money to invest and grow.”

CPD is responsible for the development and instructional design of online courses, as well as for all of the administrative and student-services elements, including technical support and marketing, needed to effectively deliver these programs. CPD’s academic counterpart is InterPro, which “worries about all the things that an academic department normally worries about,” says Borbely. InterPro was founded in 1998, and off-campus enrollments enable their existence because the revenues from distance learners make it possible to fund the appointment of faculty teaching courses that are vital to graduate professional programs. We would not be able to pay for that if we did not reach critical mass. In turn, we and off-campus student-customers are able to count on InterPro to produce what we need in the way of administrative support, teaching assistantships and getting faculty to participate.”

Faculty are paid one month’s salary off-load for developing courses in these graduate-level programs, with the assistance of CPD, which is quite different from what they get paid for developing non-credit professional-development courses and certification programs.

B. Non-Credit Professional Development Courses and Certification Programs
The side of CPD that offers professional development has operated more like an independent, small business within the University of Michigan College of Engineering. “We speculate on the market potential for a given course the same way we would if we were renting hotel space in Chicago,” Borbely jokes.

“We work with faculty directly to develop and produce the content, and each deal is unique. Of course, there are limits in terms of university policy on how and how much we can pay faculty. We produce the course, and typically the compensation for faculty involves a combination of some costs to develop the course—so they are compensated for developing the course—and a royalty scheme at the university that is modeled after the similar policies for licensing new technologies. A portion goes to the individual faculty member; a portion goes to their academic dept; and a portion goes to the College of Engineering. It’s basically a third, a third and a third. You come back to break even, and then all profits or return on investment is divided in thirds.”
When asked how much faculty get paid for course development, Borbely said “it depends on the individual. We have a range to compensate them for their time, whether they are teaching in front of a classroom (many of these online courses include videotaped lectures that are streamed for viewing online by students) for a “short course,” or whether they are spending a day, or a fraction of a day, developing a course. When it is a development effort, the same rate card applies, meaning we pay faculty on a scale from $1,500 to $4,000 a day.”

How much a faculty member is ultimately compensated can also be based on what the market will bare, adds Borbely. “A lot of it has to do with the perceived market potential for a course; it has nothing to do with how advanced the level of material is.” In the end, the cost of faculty is rolled into the budget along with all of the outer expenses and overhead related to producing and delivering any given course.

Just like in the credit-bearing graduate programs, CPD provides all of the administrative and student-services elements, including technical support and marketing services for the non-credit professional develop courses and certification programs.

In relation to quality control and learning effectiveness strategies, Borbely says that CPD has relied on a combination of feedback from its students and the corporations who enroll in these professional development courses on a volume basis. “It is a combination of direct feedback and aggregate feedback from corporate customers.”

Borbely adds that CPD’s professional develop enterprise has been successful and that they “have plans to put a lot more online.”

IX. UNIVERSITY OF GEORGIA

Location: Athens, GA
Student Population: 33,405
Type of Institution: 4-year public
Carnegie Classification: Doctoral/Research Universities—Extensive
Distance Education Units:
  University System of Georgia Independent and Distance Learning
  eCore: Georgia’s College Core Curriculum Online
  Subsidized Service Unit - Overhead Funded
Websites:
  University System of Georgia Independent and Distance Learning: http://www.gactr.uga.edu/idl/index.phtml
  eCore: Georgia’s College Core Curriculum Online: http://www.gactr.uga.edu/ecore/
Based on Interviews with Nancy Thompson, Head, Independent and Distance Learning/eCore, and Brad Cahoon, Director for the Division of Distance Education

The University of Georgia Center for Continuing Education is responsible for two distance education units in the University System of Georgia: Independent and Distance Learning (IDL) and eCore.
A. Independent and Distance Learning

IDL has its roots in a long history of correspondence courses offered by the University System of Georgia institutions dating back to pre World War II. In the late 1940s these were centralized in the Center for Continuing Education on the Athens campus. Today IDL offers about 140 credit-bearing “self-paced” courses, with about 60 of these courses being offered in an online format, and the remainder being offered in a print-based format.

The University System of Georgia offers students higher education options at 34 colleges and universities throughout the state, providing a wide range of academic programming, including certificates, associate, baccalaureate, master's, doctoral and professional degrees.

IDL students do not have to be admitted to the University System of Georgia to enroll, though many current University System of Georgia students supplement their on-campus classes with IDL courses. Students can register at any time for IDL courses. Tuition for IDL courses is $152.00 per semester hour, with the exception of those University of Georgia students who are classified as nonresident (out-of-state) students. Out-of-state students who wish to receive resident credit for IDL courses must pay $661.00 per semester hour.

In each course, there are lesson assignments corresponding to assigned readings in required texts or materials. These assignments are submitted consecutively via mail or online to IDL, where they are logged before being forwarded to an instructor. If any students need to contact the instructor, a note can be included with a lesson, or they may contact him or her via e-mail or phone.

The maximum time allowed to complete an IDL course is nine months, though students are strongly encouraged to finish these courses in less time. Students must be enrolled in the course at least eight weeks, and all required lessons must be submitted and completed before taking a final exam.

B. IDL Business Model

“We have perhaps an unusual program financially in that we retain all of the tuition revenue from students who take these (IDL) courses, and that revenue stays here and more than offsets the cost of payroll and operations,” says Cahoon. “The program generates a surplus that is used to fund additional course development and for other programs here in continuing ed.”

Planning of any new courses is the responsibility of IDL. “It is a collective decision based on our perceptions of what our market will support, and sometimes faculty here at the university or from other institutions will approach us with a special interest for creating a course. Some of those projects get off the ground, and some don’t.” Cahoon explains that this decision-making process is more of a “rule of thumb” approach, but “we need to quantify this a little bit more rigorously, and we have, in terms of assessing the financial performance of courses. We have a lot of data about the enrollment of each course and what it is contributing financially.”

Faculty interested in developing a course submit one lesson and an overview of the course. If approved, they will earn $1,800 for developing a complete course. A team of web designers from the University of Georgia Center for Continuing Education Department of Web Instructional Development builds out all of the IDL courses in a standardized format, although there is variability in the way faculty write and present their content. Faculty are the final authorities on what content ultimately goes inside their courses. Faculty
are paid another $1,500 per course for a full revision when necessary.

The responsibility of learning effectiveness and quality control of IDL courses, which are basically replicas of University System of Georgia face-to-face courses, are shared with the academic units, says Cahoon. “Our goal is to make sure that learning outcomes are equivalent to face-to-face classes.”

IDL hires faculty based on academic department recommendations and approval. However, if an IDL faculty member is not up to speed and his or her evaluations continue to slide, “we relieve them of their responsibility,” Cahoon says. “That is the ultimate control that we have.”

IDL is also responsible for student services through its student services unit, which consists of three representatives who help to register and advise students. However, 70 to 80% of IDL students are University of Georgia students who take one or two courses and receive the full benefits of student services at their home campus.

C. eCore

eCore—short for electronic core curriculum—allows University System of Georgia students the opportunity to complete their first two years (the “core” curriculum) of their collegiate careers in an online environment. eCore consists of online freshman- and sophomore-level courses designed, developed, taught, and supported by faculty and staff from the University System of Georgia. Students register for eCore courses through one of six affiliate institutions that offer the courses and becomes the student’s home institution.

The first eCore courses were offered in 2000. “The main difference between these courses and IDL courses is that these are cohort courses running on a regular semester schedule,” says Cahoon. “The instructional design is more sophisticated because it allows for the fact that students can be involved in group discussions and other forms of group activities.”

A unit called Advanced Learning Technologies, that is directly supported by the State Board of Regents, put together teams of faculty from different institutions within the system to develop a common curriculum of eCore courses. With the help of the University of Georgia Center for Continuing Education Department of Web Instructional Development a standard set of 25 eCore courses were developed.

Instructors for eCore courses are recruited and hired by eCore from all the 34 institutions in the University System of Georgia. “Our biggest challenge right now is the recruitment of enough faculty for the number of sections we want to offer,” says Cahoon.

Student services, including advisement, are handled by each of the six affiliate institutions. “One thing we are going to do this September is pull all the eCore advisors here for a two-day meeting to go through every single service that should be provided to students and find out what is happening on all these campuses,” says Thompson. “We know that some campuses are doing a better job than others.”

D. eCore Business Model

“We are absorbing all the cost of the eCore program, because we compensate faculty, and we create the courses. We also do the technical administration of the course in terms of setting up the course sections, offered in WebCT Vista,” says Cahoon.
eCore pays $1,200 per-credit-hour to the faculty member’s institution as teacher pay. The institution then pays its faculty whatever they would normally be paid for teaching off-load or on-load. “Some institutions do have it as part of the regular teaching load, and, for $3600, they are able to hire two part-time faculty members to teach two three-credit classes [at $1,800 each],” says Thompson, adding that she does not keep track of how much each faculty member is paid by their home institution.

eCore receives revenue by retaining the tuition dollars from students who remain in eCore courses past the mid-point of each semester. The tuition is gathered at the home institution, and 80% of this revenue is sent to eCore. “We will invoice the institutions [after mid point of each semester], and they send us that money,” says Cahoon.

Regarding the decision-making process for adding eCore courses, Thompson says that initially “it was all done through a general ed committee that got together and decided which courses would be developed. The committee was comprised of Vice Presidents for Academic Affairs and faculty members from the 34 University System of Georgia institutions. We have talked about adding a couple more courses that students and advisors have said they needed, so we would probably work with that same group in developing the new courses, if we decide to do that.”

“We have much less flexibility than we do with IDL in terms of making a decision about what courses we can add to eCore,” adds Cahoon. “We have had many requests for particular courses, and we have passed those requests up the chain. We would like to develop a few more courses, but it is a very slow process for us to receive approval.”

E. Current Enrollments and Growth Prospects

eCore is starting to grow quickly. Last fall it had 1,300 enrollments, and this fall it has 1,700 enrollments. “It is growing fast in terms of demand,” says Cahoon. We just have to bring in new people.”

“We will probably need to hire a few full-time eCore faculty members,” adds Thompson. “eCore was really designed to be just the core curriculum of the System, so that any institution could build a complete degree online, and students anywhere in the System could take their core curriculum courses through eCore and then go to one of the other institutions to complete their last two years.” “I think all of us in this area are kind of making it up as we go along,” Cahoon concludes.
ASYNCHRONOUS LEARNING NETWORKS: A SLOAN FOUNDATION PERSPECTIVE

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ABSTRACT
This paper is based on a chapter in THE LEARNING REVOLUTION, the Challenge of Information Technology in the Academy (Diana G. Oblinger and Sean C. Rush, eds.), published in 1997 by Anker Publishing Co., Boston, Mass.

Over the years, small numbers of motivated individuals have studied by themselves, away from university centers, to acquire knowledge in post-secondary subjects. Correspondence study began over a century ago, and since then, other forms of “distance education” have become established. In spite of all this progress, off-campus learners have worked mainly in isolation, with only occasional contact with instructors and peers.

Today’s low-cost communications and computer technologies, however, enable learning in Asynchronous Learning Networks (ALNs), in the process simultaneously overcoming barriers of isolation, distance and those imposed by rigid time constraints. The paper describes some projects at institutions of higher education funded by the Sloan Foundation, identifies some early results and possible evolution of ALN’s to large scale implementations.

KEYWORDS
Asynchronous, ALN, Distance

I. INTRODUCTION
Over the past century, we have seen accelerating interest in education for off-campus or “nontraditional” learners. As technology and infrastructure have progressed, the advances have been modified by educators to package learning resources for these off-campus learners.

The history of serving these off-campus learners began a century ago. Correspondence style off-campus education first appeared in the late 1800s and remains popular today. Technology delivery has evolved from print and radio to broadcast television and computer-aided instruction, and now to CD-ROMs and the World Wide Web. These disparate technologies, along with some others, are the enabling tools for what is now called “distance education.” They have had a large—even revolutionary—effect on education. In the process, they have extended educational opportunities to people in places that would otherwise not have been served.

Most of today’s distance education techniques can be grouped into two categories: self-study techniques, with little or no human interaction (such as books, videotapes and learning software), and techniques with limited human interaction (such as interactive television). While these techniques continue to be important, there is one channel of learning that these techniques fail to address—the channel that goes
Asynchronous Learning Networks: A Sloan Foundation Perspective

beyond lectures, tutorials, and reading materials to permit learners to engage in interactive discussion with peers and instructors. A self-study model or a televised classroom, even one advertised as “fully interactive,” cannot begin to provide the formal and informal person-to-person exchanges that our campuses offer—exchanges that are an important supplement to lecture and textbook instruction.

Today, technologies exist that enable asynchronous interactivity, i.e., a high degree of interactivity among geographically separated learners, independent of time or place. By asynchronous we mean that participants in a discussion need not engage in that discussion at the same time, as they would in a face-to-face or telephone conversation. Rather, as in an e-mail exchange, there is some elapsed time between message exchanges—perhaps minutes, hours or even days.

Asynchronous interactivity can become the basis for a new and large-scale learning model among distance learners. Such interactivity is already the basis for project work in business enterprises, where geographically dispersed teams can develop project goals, share analyses, carry on discussion and debate, and prepare presentations or reports without ever meeting in the same room or even connecting at the same time through a conference call. Such interactions are extraordinarily popular on Internet bulletin boards and associated networks run by various Internet service providers, where people who have never met can carry on discussions on a wide variety of topics, all in a time-elapsed, asynchronous fashion.

Asynchronous interactivity is the third major distance education approach. Asynchronous Learning Networks (ALNs) combine self-study techniques with asynchronous interactivity to create environments in which learners can access remote learning resources asynchronously—using relatively inexpensive equipment—to learn at home, at the work place or at any place of their choosing. Remote learning can enlist dynamic resources such as other students, outside experts or the instructor, or more static resources such as assignments, course notes or libraries. Additional digital resources can include databases, spreadsheets or even software-generated simulations.

In an ALN we can think of every person on the network as both a user and a resource. This concept is crucial to the power of an ALN, making it not just an electronic network but a network of people—an interactive learning community that is not limited by time, place or the constraints of a classroom.

Rapid asynchronous access to resources is made possible by computer and communications technologies. Group activities or team projects involving discussions, spreadsheet analysis or report preparation can be carried out through commercial software linked to computer conferencing software or “groupware” [1]. In an ALN, “lectures” can be transmitted through groupware, videotape, CD-ROM or the World Wide Web. Books and other printed material continue to have a role. Material may be posted on the World Wide Web or it may be provided through fax or a voice-response unit [2]. All represent asynchronously accessed resources. Most of the academic campus activities a student might participate in (Table 1) have an asynchronous analog, which allows us to envisage “distributed classes,” populated with learners we can think of as “distributed cohorts,” in the same way we think of on-campus classes and cohorts. Participants in these distributed classes, however, access resources and interact asynchronously.

The Alfred P. Sloan Foundation has established a program to explore the potential of ALNs to provide learning to anyone who wishes to learn, at a time and place of the learner’s choice. Projects at a number of mainstream, campus-based institutions, devoted to exploring the unique possibilities that might emerge from ALNs, are an important element of the Sloan Foundation program. The basic ideas underlying computer network learning pre-date the Sloan projects, having been discussed in the 1970s [3] with early implementations starting in the 1980s. The number of these implementation projects has grown steadily,
so that today, hundreds of courses are listed on the Internet. Some degree programs are available, as well.

Although real progress has been made in asynchronous education, this growth is limited. The number of courses available on-line is relatively large, but most are isolated offerings resulting from the zeal and skill of a handful of faculty members. The courses vary widely in approach, quality and credibility. Some are little more than Web-based reading material; others are advertisements for on-campus continuing education courses. Few are part of a true learning network.

Consider the differences between on-line and classroom-based programs at established colleges and universities. Whether for traditional or continuing education students, classroom programs are more than a skeletal assembly of isolated courses; rather they are a coherent sequence of courses that constitute a curriculum. These programs lead to degrees or certification. They are listed in catalogs and are available at predictable times. Complementing their academic offerings, colleges and universities also provide sophisticated support services including recruitment, orientation, registration, advising, financial aid, grade recording and report keeping. These support services are quite robust: they handle tens of thousands of students in the largest universities.

By these kinds of measurements, asynchronous learning has much ground to cover. Even self-study and televised classrooms at major institutions are far ahead of ALN-style education in their systematic approach and accompanying services and support [4, 5]. To distribute education asynchronously in a truly useful way to off-campus learners, educational institutions will have to make a commitment to build organizations that deliver certifications and degrees along with a full array of student services. Society would benefit greatly from the emergence of such organizations serving a community of motivated learners whose life circumstances make it difficult for them to attend scheduled campus classes.

While off-campus learners will benefit the most from ALNs, it is likely that important benefits will also be realized on campuses. ALNs bring with them new kinds of functions that may, in turn, allow new outcomes. High quality computer networking is available to students and faculty at many, if not most, campuses and it is very widely used. This capacity for asynchronous access and communication, which comes at a price, is then overlaid onto traditional activities. The price is justified in terms of “improvements in learning outcomes” or, simply, better learning. However other outcomes could also be sought. For instance, peer-to-peer collaborative learning among students might be greatly enhanced through asynchronous access to each other or to tutors and teaching assistants. Improved communication among all network “nodes”—in this case students, teaching assistants and faculty—may favorably impact student motivation and retention. Learning productivity may increase. Self-pacing would also become possible for some students.

Some of the Sloan-supported projects are exploring these and other possibilities by experimenting with new ways to integrate ALNs with traditional on-campus processes. Our goals for the Sloan on-campus projects are to improve productivity outcomes with some simultaneous improvement in learning outcomes and at about the same faculty effort. A particular interest is to explore how productivity gains can, in some way, pay for the cost of the ALN. Increased class sizes reduced dropout rates and self-pacing may all lead to improved productivity. Other projects are exploring ALNs for off-campus learners. These can be either near-campus or very-far-from-campus ALNs. For example, a community college that draws students from a radius of 50 or 60 miles might establish a near-campus ALN. Courses might be taken at home or at the workplace through an ALN, but examinations, laboratory work, counseling and other support activities might require a campus visit. An ALN for learners located at greater distances from the campus requires more function and sophistication.
Some of the Sloan projects are experimenting with one or two courses before making a decision to pursue a more ambitious agenda (Table 2). Others are offering, or plan to offer, multiple course sequences leading to certifications or degrees. The focus of these courses is primarily in scientific and technical fields, although other disciplines are represented, as well. Some projects have enrollments in the hundreds. Over the next few years, some course enrollments will exceed a thousand and begin to demonstrate scalability.

It seems quite clear that ALNs offer new possibilities in off-campus as well as on-campus education. However, experience with large-scale implementation and institutional commitment are needed to realize the extent of these possibilities. The remainder of this chapter describes the issues of how well people learn in ALNs, potential outcomes from ALNs and possible evolution of this new approach.

II. LEARNING IN ASYNCHRONOUS LEARNING NETWORKS

Do ALNs work? Do people learn in these environments? Will ALN-style learning appeal to a variety of learners across a broad range of disciplines?

These are complex questions, which are embedded with research as well as practical aspects. The research questions will not be resolved quickly, since many variables need to be accounted for and control groups established for comparisons, which is a difficult task in educational environments. Over time, we will learn whether asynchronous learning is more effective in some disciplines than others, and we will learn more about student and faculty characteristics which lead to success in ALNs. For example, we may find that gender is a factor. At a more practical level, we might apply different kinds of measures. We can ask, for instance, whether the evidence we have supports a conclusion that the learning that takes place in ALNs is equivalent to traditional classroom learning. We might also try assessing the demand side. Are learners enrolling in properly delivered and properly supported ALN programs? Is a need being fulfilled? To these two practical measures, the answer appears to be affirmative. The majority of institutions in Table 2 have now gained valuable learning experience in ALNs, some quite extensive, and in all instances the indicators point to a conclusion of equal or better learning in an ALN compared with traditional methods. Some specific examples follow.

A. Example 1: CORNELL UNIVERSITY

In 1993, the Cornell University physics department began a project to re-think and restructure certain physics courses, both at the graduate and undergraduate level, in an attempt to learn more about the possible benefits of extending computer and communications usage and reducing lecture-style pedagogy. A number of ideas were tried; experimentation continues (K. Gottfried, personal communication). The following example is based on Solid State Physics (Physics 454).

Solid State Physics is a four-credit course, with three lecture sessions and one recitation section per week. Typical students are physics undergraduates planning to go on to graduate school or graduate students from engineering and other sciences. In the spring semester of 1995, Professor Robert Silsbee taught the course with no face-to-face sessions. Students were given a course syllabus, along with information about books needed and reading assignments for the semester. They turned in assigned homework problems and took one quiz per week. Learning took place through assigned readings, reviews of a library of 24 computer simulations which illustrated solid-state phenomena created by Silsbee and co-worker [6], and work on problem sets. Students worked asynchronously. The schedule required that homework problems and quizzes be turned in at prescribed times. Silsbee or a graduate assistant were available through e-mail or a Web-
based system, and class participants could get help from each other, either face-to-face or through e-mail. Silsbee has taught this course using a traditional classroom model many times during the past 30 years. Student learning involves mastering hard-to-visualize topics such as reciprocal lattices and Fermi surfaces. His assessment at the end of the semester was that this asynchronous cohort had learned as much as other classes he had taught. He based his assessment on results from homework sets, quizzes and post-semester discussions with students on the subject matter. This somewhat unique experiment is an indicator that, at least for this rather specialized group of science and engineering students, an ALN learning experience was approximately equivalent to that of colleagues in face-to-face classes.

In terms of demonstrating the full capabilities of an ALN, the experiment was only partially successful. Students did access remote resources such as the instructor and a teaching assistant over the network, and there was some networked collaboration among students. However, such collaboration was limited, possibly because the collaboration was optional and not built into the structure of the course. It is also possible that since students met in the computer lab to work on simulations, they needed less in the way of networked communications.

B. Example 2: DREXEL UNIVERSITY

Drexel University has converted eight courses in the Information Systems (IS) curriculum to a format suitable for ALN, and has been offering these mainly to their on-campus students over the past two and one-half years. One undergraduate course, System Design and Analysis, has now been taught seven times. A graduate course in Policy and Management has been taught five times.

Other courses have been taught from three times to once. Drexel’s approach is to put as much of the material needed by students as possible into a Lotus Notes database, which is accessed over the computer network. The Course Materials database contains a course description, a course syllabus, all required reading materials (books, articles and notes), criteria for grading as well as photographs and short profiles of students in the class [7].

Unlike physics, the IS discipline is not highly mathematical or quantitative. The System Design and Analysis course, for example, stresses an understanding of the factors (requirements) underpinning the application for which the software is to be designed, how to convert these requirements into a model and then to convert the model into a prototype. These elements require thought and analysis. However, there is usually no single correct answer. There are likely to be several good designs, as well as mediocre or unsatisfactory designs. Various design approaches can be refined through discussions with experts or by testing them against empirical design principles.

A design course, to be successful, also requires discussion and dialog—among students and between students and the instructor. Discussions are integral to all IS courses and in the ALN versions they are carried out in the Lotus Notes discussion database. Typically, a discussion is initiated by the instructor; student participation is required for satisfactory performance in the course. In a conventional classroom environment, one opinionated individual can dominate a discussion, in the process excluding the opinions of others. An asynchronous networked version of this phenomenon occurred in one of the Drexel classes when one individual submitted many more messages than other students. However, because of the nature of the medium, this caused no time penalty for anyone else, and the distraction was easily overlooked.

The Drexel courses are all quite structured—readings and assignments are laid out for each week of the term and one week is devoted to a substantive discussion topic. Students learn new material through
assigned readings then engage in discussions with each other. They turn in homework assignments every week—recorded in a Lotus Notes Assignments database—and carry out a system design project for the semester, also recorded in the Assignments database. All work, including readings, discussions and assignments, is carried out asynchronously. Note, however, that the overall course is synchronized. For example, everyone in the class must complete the weekly subject module.

To date, approximately 250 students have completed these courses. Homework and project grades, along with surveys and interviews with students, lead to the conclusion that learning in the ALNs is equivalent to that of face-to-face classes. Particularly striking were results from surveys which showed that virtually all (100%) students felt that seeing the ideas and assignments of others was useful, 67% felt they had more communication with fellow students, 97% felt they had more access to the instructor than in conventional classes and 91% said they would take another ALN course (Charlton Monsanto, personal communication). We should note, however, that about half of the students also indicated that they missed classroom lectures.

C. Example 3: NORTHERN VIRGINIA COMMUNITY COLLEGE

With five campuses and nearly 40,000 students, Northern Virginia Community College (NVCC) is one of the largest two-year colleges in the country. The Extended Learning Institute (ELI) unit at NVCC is specifically charged with serving home-based, non-traditional learners—who are likely to be working adults—through independent study programs. The average age of the population registering for ELI courses is 28. In 1993, the ELI unit undertook a two-stage program to implement a near-campus ALN that would, when completed, permit off-campus learners to earn a full Associate in Science (AS) degree in Engineering. Fourteen courses will have been converted to a format suitable for an ALN when the project is completed. To date, ten have been converted and offered, some several times.

The ALN is built around lectures on videotape, books and other instructional materials, recitations, homework help and other person-to-person communication through networked computers running First Class groupware. Students can register remotely through telephone and computer messaging. This is a typical near-campus ALN since students come to campus for services, such as financial aid, placement testing, or library books and periodicals. Examinations, when required, are also on campus, as are chemistry laboratories [8, 9, 10].

Chemistry I is a required course in the AS (Engineering) sequence and requires 12 laboratory sessions. NVCC implemented six double sessions on Saturdays and found this arrangement quite satisfactory for students and faculty. While the full suite of courses for the AS (Engineering) degree is still being developed, teaching experience gained so far with approximately 250 students indicates that ELI ALN students are doing as well or better in courses, in terms of grades and retention rates, as NVCC students in the same courses offered in traditional format. Faculty participating in the project are pleased with the results and with their involvement. In addition, students have been very positive in their comments and in survey responses.

D. Example 4: NEW JERSEY INSTITUTE OF TECHNOLOGY

The New Jersey Institute of Technology (NJIT) has had a long history of research and experimentation with computer conferencing and education. In 1993, NJIT started a project to develop a suite of courses in a format suitable for ALNs that would lead to two undergraduate degrees—a Bachelor of Arts (BA) in Information Systems and a Bachelor of Science (BS) in Computer Science. A total of 26 courses have
been developed and offered, some as many as six or seven times. ALN students view lectures on videotape and participate in class discussions through NJIT’s proprietary EIESII computer conferencing system. Homework assignments are received and submitted by students through this system. Because most of the courses in the ALNs were also taught face-to-face, comparisons could be made across a wide range of parameters. The conclusions are somewhat clouded by the fact that students had difficulty accessing the NJIT course server due to an insufficient number of modems at the university. But, in spite of this difficulty, students in ALN sections responded to surveys by indicating that the ALN improved their learning. Distribution of grades is an indicator that students in the ALN performed at least as well, perhaps better, than those in traditional sections [11].

To summarize this section then: evidence to date, albeit sample evidence, points to a conclusion that those who choose to enroll in ALN courses, on the average, do about as well as those who are in traditional classrooms, across a number of disciplines; measures of success here are exam and course grades and qualitative assessments of faculty about performance on assignments, homeworks and discussions. Generally, student satisfaction is as high or higher than for traditional classrooms. These conclusions are supported by results from other Sloan projects not described here. Statistically pure conclusions will require larger numbers and a rigorous effort to create equivalent “traditional” and “ALN” cohorts, and this kind of research is not likely to appear soon. Much more likely, is stronger qualitative, sample evidence of the kind cited here, and this leads to the second conclusion: the numbers of off-campus learners enrolling in ALN’s continues to rise steadily. The market is gradually putting its imprimatur on ALN.

III. NEW OUTCOMES

Several references have been made to the traditional classroom teaching model, a model that has been dominant for over a century and one that encourages certain accepted practices. For example, learners accept the necessity of coming to a campus center to learn, the idea that a degree requires four years of residence, and the premise that smaller classes and student faculty ratios are preferable to larger ones. One might conjecture that ALNs produce different outcomes, because entirely new capabilities are being brought to bear. Three capabilities—asynchronicity, efficiency and geographically distributed cohorts—brought together in different ways could create a variety of possibilities with profound implications for education. This section considers examples from a range of institutions where new outcomes are being explored.

One new possibility is widespread availability of high quality, cohort-style education (courses, certifications and degrees) for anyone, anywhere. Indeed, this possibility is the single most important motivator for developing extensive ALNs that go beyond today’s handful of degree programs and isolated courses. Progress is being made by a number of institutions in the near-campus and very-far-from-campus categories, which are developing certifications and degrees. We have already noted that NJIT is offering Bachelor degrees in Computer Science and Information Systems. Drexel has used their experience from on-campus ALNs to create a Master of Science (MS) in Information Systems that is initially being offered in the Philadelphia area starting in the fall of 1996. NVCC is offering a two-year Associate in Applied Science degree in Engineering. Other institutions are also following this path.

A. Non-residency Degrees

The State University of New York (SUNY) now has in place a degree-completion program. Learners who finish two years at any of six community colleges in the Mid-Hudson Valley can go on to complete bachelors requirements for either of two degrees without having to leave home and go to a four-year college: Liberal Studies from SUNY New Paltz, or Business from SUNY Empire State. A Lotus Notes
network and the Internet are core elements of the SUNY ALN. Stanford University, with one of the largest and most successful televised graduate degree programs, has begun to digitize its television lectures and offer them on-demand. Fourteen courses are currently available in asynchronous form, with more to follow.

**B. Non-residency Certificates**

Many certifications are also available through ALNs. New York University has already graduated two classes with a four-course graduate certification in Information Technology. They are using a Lotus Notes network and require ISDN connections [12] for learners so that video, animation and text are all part of the learning materials. The University of California at Berkeley has enrolled a class for a nine-course certification in Hazardous Materials Management, available over America On-line. The University of Wisconsin-Stout offers certification in Food Handling. Others schools are planning to offer certifications soon: Metropolitan State in Purchasing Management, Pace University in Telecommunications, Pennsylvania State University in Acoustics Engineering, and Rio Salado Community College in Computer Usage and Applications. The University of California-Berkeley has a major effort under way to have 175 of their extension courses on America On-line by the middle of 1998. A number of other institutions will also be moving forward with degree and certification offerings in the coming years.

**C. At-risk Populations**

The certificate offerings from Rio Salado and Penn State deserve additional discussion for they illustrate how ALNs can be used to meet the needs of very specific groups of distributed cohorts. Rio Salado’s Project Reachout is designed to recruit applicants from an “at-risk” population—those with physical disabilities, child care issues and transportation difficulties, factors that may be barriers to a post-secondary education. Members of this group may be the first in their families to have high school credentials. Project Reachout is having surprising course completion rates for this population, currently around 55%. Their near-campus ALN imposes a strict selection process for new applicants, including testing and interviews, to ensure maximum likelihood for success. Once selected, participants are provided counseling and other services, both face-to-face and online, to further enhance their chances for success. Participants use the computer network as an added element of a support among themselves, since encouragement and support are not always forthcoming from the families.

**D. Low Demand Specialties**

The Penn State Acoustics Engineering certification, to be offered in early 1997, also aims to demonstrate a new kind of outcome—the special value of an ALN approach in narrow specialties. Acoustics expertise is needed in many industries such as appliances, automobiles and auto parts, office equipment, aircraft, machine tools and the government sector, where noise control and vibration reduction are important to success. However, many corporations do not have a special acoustics department and may prefer that a mechanical engineer also be a part-time acoustics engineer. Higher education institutions are not likely to offer courses in such narrow specialties because local demand is low. Corporations are also not likely to have on-site classes for the same reason. This does not mean that the specialty is unimportant, only that few individuals at any location require the training. Penn State’s plan is to establish cohorts nationally when their acoustics ALN (offered on the Internet and with CD-ROMs) is rolled out, ensuring that classes of 30 to 50 can easily be assembled. Small groups of 3–5 will work together on engineering projects. Cohort-style education in narrow specialties appears viable on a national scale, even when it is not viable on a local scale in conventional classes.
E. Efficiency

Access to high quality, cohort-style learning, even for special learner segments and narrow specialties, represents a new outcome that is made possible through the three features of ALN approach—asynchronicity, efficiency and geographically distributed cohorts. But, does asynchronous access to remote resources really introduce new efficiencies? The answer is yes. The rapid increase in use of phone answering machines, digital voice response units, e-mail and groupware provide the evidence. The reasons for this may have to do with the fact that although the face-to-face method is the most efficient form of communication, in most instances such meetings do not take place very often because of difficulties and costs associated with scheduling and distances. When a group is together in a room, there may be very effective communication. Other than these instances, however, there is little or no communication. Said another way, the communication bandwidth peaks during face-to-face sessions and drops to zero in between. The result is that, averaged over periods of several hours or more, the effective bandwidth for asynchronous communication can be much higher than in face-to-face communication.

The second efficiency has to do with the fact that distribution of documents and other learning materials over the Web and groupware is more efficient than via any other method. These communication and distribution efficiencies make possible the idea of distributed cohorts. If a geographically dispersed group of people were connected only through the mail and synchronous telephony, they would effectively be a self-study group.

F. On-campus Outcomes

ALNs may also create new productivity outcomes for on-campus learning while improving learning outcomes at the same time. The University of Illinois at Urbana-Champaign has launched an ambitious project through their Sloan Center for Asynchronous Learning Environments (SCALE). SCALE plans to de-synchronize elements of more than 100 courses over a three year period and explore the possible outcomes achievable through on-campus ALNs. So far, asynchronous elements have been integrated into approximately 50 courses ranging across many fields, such as humanities, social sciences, engineering and physical sciences. Burks Oakley, Associate Director of SCALE and a pioneer in the area of on-campus ALNs, has summarized SCALE projects and activities in recent papers. He gives one particularly striking example for a high enrollment, lower division electrical engineering course, ECE270 [13].

Typically, about 500 engineering and physical sciences students enroll in this course each semester. There are usually five sections for this course. Over the past few years faculty assigned to some sections have opted for the ALN version while others have chosen the traditional version. In the ALN version, students attend lectures but carry out homework drills through a software package called CircuitTutor. Problem sets are also contained in CircuitTutor, which can be submitted for grading anytime through the network to a computer that provides a grade response almost instantly. Problems graded as incorrect can be re-submitted an unlimited number of times. Students may seek assistance at any time from fellow students or from on-line undergraduate tutors between 8 a.m. and 12 midnight on weekdays, or from the instructor. With these features in mind, it is easy to imagine the following scenario: A student completes the four assigned homework problems late at night and submits them for grading. The computer marks three correct and one incorrect. The student tries two more times but still does not get the assignment right. Of course, this situation is not uncommon in a quantitative field where problem solutions depend on a series of intermediate steps, some of which may involve computations or assumptions. A wrong answer is usually traceable to some incorrectly performed intermediate step, however the person working on the problem may be unable to find the error—the person is “stuck.” Often a few hints from someone else can “unstick” the thought process. Late at night that other person may be hard to find; an appointment with the instructor may delay the process a day or more. The solution is to turn to the learning network and ask
for help—from anyone. And help is usually swift in coming. Not surprisingly, the students in ALN sections achieved better results than those who submitted paper and pencil homework problems and received help in traditional face-to-face fashion. Students in the ECE270 ALN sections also demonstrated reduced drop-out rates. Somewhat more surprising was the fact that the superior results achieved by the ALN students were unchanged even when the student/faculty ratio for these sections was increased by 50%.

It has long been assumed that learning outcomes deteriorate as student-to-faculty ratios increase in traditional classrooms. There is, however, no data to tell us how learning networks scale—what is the relationship between learning quality and the number of people on a network? Classrooms with 10 to 20 students are quite viable, in fact, very effective. Asynchronous learning networks of this size are viable too, as the Drexel experience shows, but the work at Illinois shows that networks of 50 or more students are also viable and effective. As this work indicates, if the users within a network serve as resources to other users, a properly structured learning network may scale very differently from a classroom. The possibility of productivity outcomes seems quite real. Economic benefits could follow.

G. Laboratories
ALNs might produce other kinds of outcomes. Weekly laboratory sessions taking several hours are required in many science and engineering courses—sometimes with a partner. Could the bulk of a laboratory course be moved onto an ALN so that lab participants (and partners, if appropriate) would need to spend fewer, shorter and more intensive sessions in a real laboratory? Answers to this question would clearly have implications for off-campus learners as well as those on the campus.

At Vanderbilt University, John Bourne of the Electrical Engineering Department and co-workers have developed a software simulator for a junior level Electrical Engineering laboratory [14]. This simulator features state-of-the-art commercial laboratory equipment, electric circuit components, wires and a board on which circuits can be constructed. Part of the simulation software has exercises that direct students to familiarize themselves with the instruments and build assigned circuits. Once a circuit is built it can be tested on the simulated instruments. Recently, the Vanderbilt group carried out controlled assessments to determine the extent to which a simulated laboratory can replace a real laboratory. Students were given comprehensive exams before starting the laboratory course, either the simulated version or the traditional one. Students in the simulated laboratory then took three real laboratory sessions, versus the 12 taken by traditional lab students. The result of the assessment was that students in the simulated laboratory, with only three real sessions, outperformed the students the traditional laboratory with 12 real sessions, based on pre-and post-test comparisons of the two groups [15]. The conclusion is that ALNs involving laboratory simulations hold some promise for producing positive economic outcomes and may permit students to pursue large parts of a laboratory course away from a physical laboratory in a self-paced mode.

H. Self-pacing
Self-pacing is an attractive option for some on-campus students who wish to accelerate their progress or for others who are intellectually capable but lack the background to keep up in a regular class, and thus face the prospect of having to drop the course. A self-pacing capability may only affect a few students, and it does take away the cohort concept, but it is worth exploring, particularly from the productivity angle. The Chemistry Department at Brown University has begun an exploration aimed at understanding the extent to which material on the World Wide Web and networked communications can enable self-paced learning. Very early indications are that some students can self-pace successfully, but considerable
care is needed to select only highly motivated individuals in such a program.

There are a number of possible outcomes that could result from ALNs. Some, such as multiple courses leading to certification for off-campus learners in a wide variety of fields, analogous to a university, are likely to become a reality. Others remain attractive possibilities but are not yet fully proven.

IV. ALN: INSTITUTIONAL ADOPTION

Progress is being made toward the goal of providing anyone who wishes to learn, the opportunity to study in a time, a place, and a field of their choice. Can this progress be sustained or accelerated? The self-study and interactive televised classroom models, with occasional augmentation by e-mail communications, are well established. It would seem that a multiplicity of approaches is likely to co-exist in the future. Asynchronous Learning Networks can grow to become an important, even dominant, presence in off-campus education. Existing organizations, which specialize in networked education, and newly formed organizations such as fledgling Internet universities, are likely to contribute to this growth. The recently announced Western Governor’s University [16], for example, will most likely feature a computer network component.

The highest potential for large-scale ALNs will, however, come from mainstream, campus-based institutions because of their sheer numbers and overall presence. Not all will participate, but many will see ALNs as an excellent opportunity and will take steps to move beyond the small-scale experiments with Web-based education that are so common today. These institutions are the ones who recognize that there are no technology limitations today for implementing ALNs. Rather, the limitations come from uncertain institutional commitment. The need is to build a consensus for reaching beyond campus boundaries to develop near-campus or very-far-from-campus ALNs, or both. Institutions will face two prominent obstacles. One is to make time available for faculty to rethink their lecture style—to turn face-to-face courses into asynchronous ones. This may require the commitment of discretionary funds, since on-campus classes still need to be taught. The second is student recruitment. Explaining an ALN to off-campus learners is often a challenge. The standard expressions of “learn by computer, anytime, anyplace” lead to a perception that the requisite knowledge is in the computer, and the learner’s task is to somehow coax it out—a self-study mode. Attention to effective student recruitment will be a necessity for ensuring reasonably large class sizes and economic viability. Recruiting is only the beginning. Sustaining a significant activity built around ALNs will also require robust and responsive student services. All this requires attention to detail and new budget priorities at the institutional level.

Within institutions participating in Sloan Foundation projects, we see evidence of meaningful institutional commitment. To be more specific, we can assess the degree of institutional commitment by noting answers to four questions: (1) Are more than a few faculty involved? (2) Is the institution contributing a significant amount of its own resources to the ALN effort? (3) Does the institution have a strategic vision for a complete suite of student services, and (4) Does the institution have a strategic vision for making ALN a core, financially viable activity?

Most of the colleges and universities with near-campus and very-far-from-campus ALNs, whose ALN experiences were discussed in the previous sections, score very well in terms of these criteria. Their ALN programs will grow over the coming years; a few could grow to large-scale implementations. In summary, we see that a committed, core ALN group is in place and a start has been made towards the goal of making anytime, anyplace learning available to motivated individuals.
Making quality education available to off-campus learners through ALNs is a primary goal, but other possible outcomes arising from asynchronicity, efficiency and distributed cohorts were also highlighted earlier. We can be quite confident that these outcomes will be explored and exploited by the activities of institutions committed to off-campus education, but serious exploration in the on-campus environment is at a very low level. This might seem surprising, since, as noted earlier, most major institutions have wired campuses with high-speed Internet connections carrying a large amount of traffic. However, exploration of new productivity outcomes, is largely absent, partly because there appears to be little motivation to explore outcomes which could impact costs through larger class sizes, improved student retention, and self-pacing, while at the same time improving learning quality.

More exploration in on-campus environments is necessary so we can gain new insights about proper balance between ALNs, lectures, recitations, laboratories and other on-campus process. Universities such as Illinois, Michigan State, Virginia Polytechnic and Brown, are already exploring these issues, but are still at an early stage. Explorations at many other institutions are also needed. Even the small number of on-campus explorations presently under way are yielding important information about new outcomes and validation of some of the early indicators is likely over the next few years.

V. CONCLUSION

Asynchronous Learning Networks are a relatively new kind of entry into the milieu of technical possibilities that make up the area broadly known as “distance education.” They combine elements of self-study techniques and asynchronous interactivity, which along with synchronous interactive television, are the building blocks for most distance education implementations. The appeal of ALNs lies in their ability to enable anytime, anyplace education with high human interactivity for geographically distributed cohorts—and these characteristics could make ALNs the largest contributor to distance education.

Although ALNs do not depend on courseware of any kind, available courseware or commercial application software can be used effectively. We have seen where specialized, faculty-developed learning software played an important role in the Cornell and Illinois examples. However, NJIT, NVCC and Drexel, among others, use only commercial software. ALNs do require asynchronous communication software, which can range from e-mail to bulletin boards to sophisticated groupware, and other asynchronous communications methods such as voice response units, all available as standard commercial products. ALNs need large-scale implementations, and current work is creating an experience base for future large-scale activities. Any substantial teaching experience thus far has been with commercial bulletin board and groupware packages, delivered on the Internet or on private networks. Future implementations will mainly be Internet Web-based. While near-campus and very-far-from-campus ALNs are likely to be important in distance education, the attributes of asynchronicity, increased efficiency and distributed cohort groups open up new options for on-campus education as well. These options, now being investigated at a number of institutions, aim to discover new balance points between traditional on-campus processes and ALN-style learning with a view to improving learning quality and reducing costs.

A number of mainstream institutions are offering degree and certification programs through ALNs. More are preparing to follow. There is evidence of serious institutional commitment to sustain and grow these programs, and we will see large-scale implementations within the next few years. Asynchronous Learning Networks will be an important element of the options offered by many mainstream institutions, best known today for their campus programs.
VI. STUDENT ACADEMIC ACTIVITIES

<table>
<thead>
<tr>
<th>TRADITIONAL, ON-CAMPUS</th>
<th>ALN ANALOG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance at lectures</td>
<td>Books (on-line or hard copy), Web postings, videotape, Groupware (Text and image or video-on-demand).</td>
</tr>
<tr>
<td>Recitation sections</td>
<td>Groupware, Interaction on Web.</td>
</tr>
<tr>
<td>Interaction with peers</td>
<td>Groupware, Web, List serve, e-mail.</td>
</tr>
<tr>
<td>Self-study, library</td>
<td>Books and Articles (on-line or hard-copy), Web resources</td>
</tr>
<tr>
<td>Lab work</td>
<td>Computer simulation, lab kits, remote control of instruments.</td>
</tr>
<tr>
<td>Interaction with tutors and TA’s</td>
<td>Groupware, Web, List serve, e-mail.</td>
</tr>
<tr>
<td>Interaction with faculty</td>
<td>Groupware, Web, List serve, e-mail.</td>
</tr>
<tr>
<td>Attendance at seminars and colloquia</td>
<td>Videotape, video-on-demand (over ISDN and groupware or Web).</td>
</tr>
<tr>
<td>Enquiries: academic &amp; administrative issues</td>
<td>E-mail, Voice-response Systems</td>
</tr>
<tr>
<td>Exams</td>
<td>Timed examinations and submission over computer network or proctored exam at remote site.</td>
</tr>
</tbody>
</table>

Table 1: Typical learning-related activities for a student at a traditional institute of higher learning (lefthand side), and examples of asynchronous analogs (right hand side).
<table>
<thead>
<tr>
<th>ON-CAMPUS</th>
<th>NEAR CAMPUS</th>
<th>VERY FAR FROM CAMPUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown University</td>
<td>Augusta Technical College</td>
<td>New York University (1) (2)</td>
</tr>
<tr>
<td>Cornell University</td>
<td>Chattanooga State Tech</td>
<td>Pennsylvania State University (1)</td>
</tr>
<tr>
<td></td>
<td>Drexel University (1) (2)</td>
<td>University of California-Berkeley (1) (2)</td>
</tr>
<tr>
<td>Drexel University</td>
<td>Ferris State University</td>
<td>Pace University (1)</td>
</tr>
<tr>
<td>Michigan State University</td>
<td>Lesley College</td>
<td>University of Hawaii</td>
</tr>
<tr>
<td>University of California</td>
<td>Metropolitan State University (1)</td>
<td>Stanford University</td>
</tr>
<tr>
<td>(Irvine)</td>
<td></td>
<td>University of Maryland (1)</td>
</tr>
<tr>
<td>University of Illinois</td>
<td>Gadsden State Community College</td>
<td>New Hampshire Tech. College</td>
</tr>
<tr>
<td>(2)</td>
<td>Miami-Dade Community College</td>
<td>University Of Minnesota</td>
</tr>
<tr>
<td>Virginia Polytechnic &amp;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>State University (2)</td>
<td>New Jersey Institute of Technology (1) (2)</td>
<td></td>
</tr>
<tr>
<td>University (2)</td>
<td>Northern Virginia Community College</td>
<td></td>
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<td></td>
<td>Rio Salado Community College (1)</td>
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<td></td>
<td>State University of New York</td>
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<td></td>
<td>Trident Technical College</td>
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<td>University of Wisconsin-Stout</td>
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<td>Vanderbilt University</td>
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<td></td>
<td>Villa Julie College</td>
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<td></td>
<td>Westchester Community College</td>
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<tr>
<td></td>
<td>Western Governors University (1) (2)</td>
<td></td>
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<tr>
<td></td>
<td>Wytheville Community College</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Institutions participating in Sloan ALN Program

(1) Degrees, Degree completions or Certifications offered or planned.
(2) Potential for large (i.e., more than 1000 enrollees per year) though present numbers are substantially smaller in most cases.

VII. REFERENCES


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TESTIMONY TO THE KERREY COMMISSION ON WEB-BASED EDUCATION

Frank Mayadas
Program Director, Alfred P. Sloan Foundation

I. INTRODUCTION

My name is Frank Mayadas; I am a Program Director with the Alfred P. Sloan Foundation. Since late 1992, before there even was a commercial internet, the Foundation has had a program in what is now called online learning, through which we have provided over $35 million in grant support to over 50 institutions of higher learning, members of the Sloan Consortium, or Sloan-C. We estimate that approximately 150,000 learners have enrolled for courses offered by Sloan-C institutions, and several hundred have received degrees. Over 170 complete degree and certificate program are offered by Sloan-C members, and can be accessed at the Sloan-C Catalog website (www.sloan-c.org). We estimate that roughly two thirds of the credit courses offered over the internet in this country today are offered by Sloan-C institutions.

We at Sloan believe that online learning represents one of the most important developments of the past hundred years for higher education. We plan to continue our support for this area. Today, I propose to touch on four points:

- First, I will address just what online education is, since it means different things to different people;
- Secondly, I will take up the question of what kinds of metrics apply to this area;
- Third I will briefly discuss activities underway, or what is really going on;
- And finally, I would like to discuss applicability of online learning to workforce development.

II. WHAT IS ONLINE LEARNING

Online learning today, is of two basic kinds (although there are grades in between): one is a self-study, or “broadcast” model in which materials, may be quite sophisticated multimedia, but self-study materials nonetheless, are posted on the web, and these are perused and studied by learners at their own pace. This model can also be thought of as a form of online publishing. I remind you that self-study, mainly through books, but more recently augmented by videotapes or broadcast TV, has been available for over a century, and unusually disciplined individuals have been able to learn and earn credentials on their own.

The second model, the “interactive” model is one where “classes” begin on a particular day with a cohort group, are taught by a faculty member who interacts with individuals or the cohort through group e-mail tools, generally referred to as group conferencing software. Interaction with the instructor is not occasional or incidental, rather it is regular and continuous, as is interaction among students. The student/faculty ratio is about the same for these online classes as that for equivalent campus classes. The “class” also ends on a particular day, i.e. the “term” is completed. This interactive model is the basis for most of the grants made by Sloan, because we believe it most closely parallels the learning environments associated with quality learning. Here is why:
For a very long time, quality education has been associated with education on campuses. Campus education has many elements, but there are three that stand out in their importance for education of students:

First, students have access to learning materials. These might include books, classroom handouts such as notes, or special kinds of educational software that may be commercial products or developed and distributed locally by faculty. These learning materials are often used in self-study fashion.

Second, the student has access to a professor. The professor determines overall content for the course and the pace of the course. He/she may add thoughts and insights to what is in the learning materials, and has the task of assessing how well a student has learned.

Campuses offer a third element for learning: other students. Students turn to friends and colleagues for many reasons on many occasions, usually informally to seek help for instance in understanding the particulars of a lecture, or assistance with a problem set.

We at Sloan constructed our program around the idea that these three important elements of campus education...learning materials, the professor and other students...could be provided through the Internet to learners at remote locations. In other words, the kind of quality learning associated with campuses is now possible for everyone and available in a multiplicity of environments...the home, the desktop at work, hotel rooms, and quite likely on airplanes as well. Such learning environments operate 24 hours a day, and 7 days a week, though they generally begin and end on specified days. They allow anytime, anyplace, or “asynchronous” learning.

Successful grant applicants in our program have proposed projects to us that involved an appropriate balance in these three important educational elements, and all have gone on to implement successful projects, many of which today are offering full degrees, and in some cases, multiple degrees. In our projects, as in classroom courses, students are expected to purchase learning materials such as books and CD-ROM's. Notes and other materials are usually available as web postings, and pre-recorded lectures are sometimes made available as streaming media.

Our online learning model envisions the Internet as primarily a communications facilitator, between instructor and students, and students and students, and secondarily as a medium for distribution of learning materials. To emphasize again: nothing is “canned” or pre-recorded in an interactive course other than the self-study learning materials and these of course are about the same as the “canned” materials used in campus education. Interactivity here means interactivity with the instructor and other students and this is all time-elapsed conversations very similar to e-mail exchanges. The online publishing, or broadcast model, primarily envisions the Internet as a distribution medium for learning materials. In the decades to come, both models will see widespread adoption, as will some models that combine aspects of the two. The broadcast and interactive models have different consequences.

The broadcast model generally requires expensive efforts to create learning materials, basically multimedia software, simulations and video. These expenses might be several hundred thousand dollars per course, but there really is no limit, and I am aware of courses costing over a million dollars. The interactive model requires relatively little start-up funding, maybe $10,000 or less to create a typical college course. Typically, we support projects at a level of about $150,000 for a full master’s degree, and we require that courses be delivered to learners through very conventional PC’s costing under $1000, and
very conventional modem connections to the Internet. Because student/faculty ratios approximate those on campus, the interactive model does not lead to a reduction in faculty (in fact, if total enrollments increase because courses are accessible to more learners, the number of faculty needed increases).

III. ASSESSMENTS AND METRICS
The most commonly asked questions about online learning focus on the subject of “quality”, i.e. does it work? We are however asking our project to provide a 5-part assessment:

1. ACCESS: To what extent has the interactive model increased access to quality education, beyond what would have been possible through the established method of distributing self-learning materials.
2. LEARNING EFFECTIVENESS*: What has the project learned about how well learning takes place.
3. FACULTY ATTITUDES*: What has the project learned about how easy (difficult) it is for faculty to develop and teach online courses.
4. INSTITUTIONAL MOTIVATION: Is there sufficient motivation for the institution to scale up online education (this may involve financial and other considerations, and earlier in the program, we referred to it as “cost-effectiveness”).
5. OVERALL STUDENT SATISFACTION: What has been learned about overall satisfaction of enrolled students (one quantitative measure here is student retention and completion rates).

Recent papers from Sloan-C members on these areas are in the Sloan-C Series on Quality, John R. Bourne and Janet C. Moore, Eds., which are available at Amazon.com and at http://www.sloan-c.org/.

All projects are different in the details of their pedagogical approaches, delivery technology and student services, and so understandably, results tend to vary. In particular, results for a specific course depend greatly on the teaching ability, motivation and experience of the faculty member. We know this is also the case for classroom courses.

Nevertheless, based on our considerable experience, and based on experience with classes that are taught on campus and on the internet by the same instructor giving the same examinations, on balance, we do not find any significant variation in learning effectiveness between classroom and online courses taught in the interactive mode.

Quality of courses and degrees offered today through conventional campus education is not of uniform quality. Similarly, there is no reason to believe that the over 170 degree and certification programs listed on the Sloan-C Catalog are of uniform quality. To be listed in the Catalog, an institution must offer its courses through the interactive model, and must be able to assert that an online program is equivalent in quality to the same or similar one offered on campus.

IV. THE CURRENT PICTURE
Although much attention goes to new kinds of online learning organizations, consortia, and for-profit education, the fact is that most online learning today is provided by traditional institutions, i.e. community colleges, comprehensive 4-year colleges and some top-tier state universities. In fact, few if any students at all, are currently enrolled in the highly publicized for-profit degree-education providers. An impressive
database of information is being accumulated through the real experiences of these institutions. We estimate that for the 99/00 academic year just completed, 300,000 learners enrolled in for-credit courses from these institutions. We expect this number will double for the academic year just starting.

We further estimate that over half these enrollments, perhaps two-thirds, came from member institutions of the Sloan Consortium. Which range from major research institutions such as Stanford, University of Illinois and Penn State, to Community Colleges such as Northern Virginia Community College. By our reckoning, the three largest entities in online education today are the University of Maryland University College, the SUNY Learning Network (SLN) of the State University of New York, and the University of Phoenix, the only for-profit institution to have any significance in national enrollment numbers for the current period. All these institutions offer courses through the interactive model. A large number of courses and learning modules, for which I do not have an estimate, are also provided through the broadcast model. These are mainly of the non-credit variety and they are proprietary (within a corporation for example) and many are also available to the public.

V. WORK FORCE LEARNING

We believe online learning has very large significance for our work force. The workforce of tomorrow will have to be better trained, and better able to access education, training and other knowledge resources. The Internet provides the ideal mechanism for this access. Some of the necessary courses, certifications, degrees and other kinds of knowledge modules are available today, but not many and not enough. Many more are needed.

A convenient way of conceptualizing workforce learning is to think in terms of “industries,” and to further inquire if industry-specific learning resources are widely available online for access by workers in that industry, or for those who seek skilled positions in that industry. I would like to describe one Sloan project that aims for impact by industry.

In 1998, supported by a Sloan Foundation grant, the Council for Adult and Experiential Learning (CAEL), convened a series of meetings with representatives of the major telecommunications services providers (NYNEX, Bell Atlantic, U.S. West, Ameritech and SBC) and representatives of the unions for the telecommunications industry (CWA and IBEW) to agree on a curriculum, governance structure, and an education institution to provide an A.S. degree for industry workers and those who wish to enter the industry. These meetings were successful in their purpose. A curriculum was agreed to and Pace University in New York was selected to develop all courses and to deliver them online and to be the degree provider. A governance structure was also agreed to (the informal industry/unions committee was re-constituted as NACTEL, the National Coalition for Telecommunications Education and Learning, and NACTEL oversees all aspects of the program, now in place). In this task, NACTEL is assisted by CAEL and by the Sloan Foundation, which provided initial funding to Pace, and CAEL. The first classes under the NACTEL program were given in 1999 (see www.nactel.org). Since then the program has seen approximately 2000 enrollments, and has a target of enrolling over 5000 learners by Y/E 2001. The results so far, reflect a very high level of satisfaction by workers who have enrolled, and a course completion rate of 83%, or about equivalent campus results for similar curricula.

So far, only union members and employees of the participating companies are in classes, but once the program has gone beyond the start-up phase, it will be expanded to a larger audience. None of the initial founding partners, companies or unions, have dropped out, though the list of participating companies is shorter due to consolidation in the industry. Citizens Communications recently applied for and received
membership in NACTEL. NACTEL is in the process of establishing itself as a non-profit corporate entity, and is already exploring new kinds of educational offerings for this industry. They expect to seek additional funding from Sloan for new programs, but over time, they will attempt to become self-sufficient. The program has been further strengthened by a grant from the Department of Education’s LAAP program administered by their Fund for Improvement of Post-Secondary Education (FIPSE).

Meanwhile, the Sloan Foundation has already provided grant support to CAEL to begin discussions with the Electric Utilities industry about a similar program, and additional grants are being considered for Airlines, the Auto Industry, Construction, and Financial Services. One grant has been awarded to the Association of Joint Labor/Management Educational programs in New York, to explore the possibility of NACTEL-like programs for selected State Government employees.

We should think of these efforts as only a beginning. Industry-specific offerings are an important way to ensure workforce learning, and offered in asynchronous online fashion, anytime, anyplace, they are a solution to the need for more family-friendly ways for workers to acquire education and training. Many more such programs are needed, far more than Sloan or any other private funder can provide. NACTEL delivery is entirely in the interactive mode.

VI. POLICY RECOMMENDATIONS

OVERALL RECOMMENDATION: Our experience with the interactive model of online learning shows that this way of teaching works. It enables quality education to reach out to vast numbers of people that otherwise would be denied education and training. The Government, whether in tuition support, fellowships, or support of training should support quality online learning as it does classroom learning. Quality, not mode of delivery should become the criterion for aid, recognition and support.

VII. ABOUT THE AUTHOR

Prior to coming to the Sloan Foundation, Frank Mayadas spent 27 years at the IBM Corporation. He was Vice President, Research Division, Technical Plans and Controls, from 1991 to 1992; Vice President, Technology and Solutions Development, Application Solutions Line of Business, from 1989 to 1991; General Manager, University and College Systems, IBM Personal Systems Line of Business, from 1988 to 1989; Secretary of IBM’s corporate Management Board and the IBM Management Committee, from 1987 to 1988; and IBM Research Division Vice President and Director, Almaden Research Center, San Jose, California, from 1983 to 1987; and an IBM Research Division Director, Technical Planning and Controls, from 1981 to 1983.

He received a Ph.D. in Applied Physics from Cornell in 1965; and a B.S. from the Colorado School of Mines in 1961. He has over 35 published papers in Systems, Devices, and Solid State Physics, and holds several patents, and awards from IBM. He is a Fellow of the IEEE, a member of the American Physical Society, and a past Director of the Society of Engineering Science. He is also a member of the National Advisory Board for Georgia Tech, and the Advisory Board of the College of Engineering, University of Illinois at Urbana-Champaign.

His areas of Sloan Program Interest include: Careers, Learning Outside the Classroom (Asynchronous Learning Networks), Universities and the Economy, Globalization, Industry Studies, and the Scientific and Technical Work Force.
I. INTRODUCTION

My interest in learning over networks dates back to 1989. In 1989 there was no commercial Internet. It was hard to get people interested in learning over networks or to even to understand what learning over networks meant or could mean. Fortunately, in 1992 I was joined at the Sloan Foundation by an extremely able program director, Frank Mayadas. Then we were able to get a real program started.

I am glad that I have been involved in this field for many years, because if I had to build up a picture of Internet learning now, from what is available to be read in the newspapers or news magazines, I would be thoroughly confused. I would not be able to find out what was really meant by Internet education. I would not know whether this thing, whatever it might be, actually provides real learning or not. I certainly would not know whether this thing, whatever it is, is significant for the present day providers of higher education; today’s universities, four-year schools and community colleges.

The sort of thing you can easily read about is UNext, a highly publicized for-profit company. UNext plans to use educational materials supplied by leading universities. UNext says grandly on its web site “Welcome to the Future of Learning.” Columbia University, a participant, describes it as a groundbreaking distance learning enterprise. And its board of directors is heavy with Nobel prizewinners. Nevertheless, if we are looking for solid information about distance learning, surely this is not it. If we examine what UNext, has actually done, we find that to date no courses have actually been given. Therefore most of the extensive discussions of UNext are, at this time, just speculation.

A somewhat more negative view was provided by Supreme Justice Ruth Bader Ginsberg at the dedication of the Rutgers Center for Law and Justice. There Justice Ginsberg asserted that while she could see the uses of the internet as an aid in legal education, “I am troubled by ventures by Concord where a student can get a J.D.…without ever laying eyes on a fellow student or professor.” Like those who predict wonderful learning outcomes, this view too is speculation. At the time of Justice Ginsberg’s remarks only 26 people were enrolled in the Concord Law School, and they were starting their first semester.

Back on the super positive side, Western Governors University made headlines in 1996, and even as recently as 1998 was described in a usually very sober publication (the Chronicle of Higher Education) as “A New Model for Higher Education.” Its enrollment projections, described in the article, at that time for the 1999–2000 academic year were about 15,000. Its actual enrollment today is about 250.

All of these assertions both positive and negative are fired off as if there was a vacuum of real knowledge
about teaching and learning in this new mode. But while these assertions were being made, and well beneath the radar screens of the newspapers and news weeklies, there has been real activity. Institutions of higher learning that have been teaching for many years and were not, like those I have just cited, invented yesterday, were teaching real people in significant numbers. So let me describe the state of the art today based not on speculation but on the actual, and largely unreported, experience of these schools.

II. NATURE OF THE NEW TECHNOLOGY

First a few remarks on the technology itself. In the Internet we certainly have a new technology available that is relevant to learning. But this in itself is not new. There have been many technologies that have been heralded as likely to have a major effect on education, ranging from the audio visual, to educational films, to Plato (the computer instruction not the Greek Philosopher) and other computer aided instruction, as well as a vast variety of televised courses. But to date none of these have had significant impact.

In actual practice the traditional classroom has proved to be quite resilient, which is a quality that we should respect. What is happening now, may well be different, because it accepts the fundamentals of classroom teaching, more or less as we know them now, but reproduces them outside the classroom.

After all, what are the elements of higher education, as we know them here at Yale or at any other college or university?

First there is the Professor. He or she leads the class, sometimes writing, sometimes showing slides, sometimes responding to questions. This person, also, if you persist and have good timing, can also sometimes be found in his or her office for one on one discussion.

A second element is the course material. Sometimes this is available in the form of a textbook, sometimes in the form of references; sometimes you just listen and take notes.

A third element is classmates. They help both in and out of class. They provide an element of shared experience, and they are people with whom both the course content and what the professor meant can be discussed between classes. They also provide important emotional support.

Today it is possible to provide some form of these elements electronically, without a campus, without a classroom, and without the necessity for the learner to be at some fixed place or time when a lecture is being given.

Through the Internet we can access course material, put there by the Professor. This can be video portions of a lecture and slides stored electronically, or it can be text covering the same material. Through the Internet we can interact with the professor by electronic mail. Through the Internet we can in some sense discuss with our classmates, even though we have never seen them, the course material and things that are obscure. We can for example send a message to our classmates “I’m baffled—can anyone do the problem on page 13?”

We call systems that do this ALNs, Asynchronous Learning Networks, and this is the form of new technology that I consider significant and that I am going to discuss today.
III. BEYOND THE TECHNICAL: WHAT WE KNOW TODAY

Certainly naming the elements of today’s educational process and showing that something like those elements can be reproduced outside the classroom does not mean that this process will work. It is not obvious that this process can really educate people or that people will want to learn this way. It is a real question—Will people really learn this way?

Fortunately the question of whether ALNs, asynchronous learning networks, really work with real people, has, to a considerable extent, been answered by considerable practical experience. To date, the 47 schools of the Sloan Consortium alone have provided more than 4,000 faculty-semesters of ALN teaching experience and more than 100,000 enrollments (an enrollment is one student semester). All ALN projects initiated under Sloan grants are still in place whether or not we provided follow-on funding; in fact, most have been considerably expanded through use of non-Sloan money. We estimate that schools that have received Sloan grants will provide 85,000 enrollments during this academic year and will be offering 70 full degree programs. The participants are a very wide range of institutions. They range from research universities to community colleges. For this academic year the University of Illinois will have 4,500 enrollments, Penn State will have 3,000, Stanford University 3,000, SUNY, the State University of New York will have 12,000, University College, the extension arm of the University of Maryland will have 12,000 and Northern Virginia Community College will have 6,000. All sorts of courses are being given ranging from Accounting to Mechanical Engineering to Computer Science, Criminal Justice, Sociology and Philosophy. For more on the Sloan Consortium see http://www.sloan-c.org.

So we can do more than speculate, there is a real experience base to work from. We can reasonably ask from this considerable experience: what is it that we know today about this kind of learning?

The main thing is that we are confident that the students are not only taking courses, they are actually learning. Many comparisons of learning outcomes have been made; this is usually when the same course is taught off campus and on campus by the same professor giving the same exams. Usually the learning outcomes for the different sections are indistinguishable. The off campus and on campus groups usually score about the same. Of course they are not always the same. But enough work has been done in enough areas to see that this outcome is not the exception but rather the rule to which there are exceptions. With 100,000 enrollments there are plenty of individual horror stories as well as stories of exceptional learning results, but the clear consensus is that with the same faculty/student ratios, which is what we have by and large in the Sloan Consortium, learning quality is about the same.

We also know there are both pitfalls and advantages to this new approach that are not mere redoes of the older world.

While an ALN is an attempt to reproduce the basic elements of classroom teaching, it is certainly not the same as classroom teaching. It has both weaknesses and strengths compared to classroom teaching. An ALN lacks, for example, the instantaneous interaction with the professor that a good classroom has, a classroom where a question can be asked and answered in real time. But it also means that people who are shy about asking questions in class can not be crowded out by those who are much more vocal. They can send their questions, more freely and more thought out, through the calmer medium of electronic mail.

We have learned that if homework is constructed to be instantly electronically corrected and returned it can be an important learning tool; we have also learned that inadequate training on the fundamentals of the underlying software can lead to the disappearance of a large portion of a class, before learning about
the course material itself has even begun. We have learned, as one might expect, that lab courses are a problem, but one that usually can be dealt with by various expedients. And we have learned that institutions of higher learning can adapt to these new students, register them at a distance, and deliver instruction.

We have learned that ALN courses can be given to students having the usual qualifications by the regular faculty, as they are at University of Illinois and Penn State and SUNY, or through the traditional extension arm, as they are at the University of Maryland. And the results in both cases are overall the same as they were with classroom teaching.

We have learned that ALN can be done in a wide variety of styles, text based, video based and everything in between and that all these styles can work (or not work). It is still pedagogy that counts. We do know enough today to say that a new technology has arrived on the higher education scene and that it works. Let us therefore consider some of the consequences.

IV. CONSEQUENCES

A. Consequences for Learners
For the learner it eliminates the cost of travel, lodging, and, most of all, the cost of foregone opportunities. You can be working; you can be at home with a family, and still have the ability to learn. Because of this the overall market for higher education and advanced training will certainly be made much bigger by ALNs.

B. Consequences for Professors
For those who teach ALN classes, teaching will be different. How different depends on the form of ALN employed. One cheap simple and direct way is to videotape the professor giving lectures and put the written material up with the tape in the form of slides. Assignments are posted on the website as is reading material. Other forms put what would have been the lecture material up simply as text and go on from there. One of the things we have learned is that there is no one form of ALN. Just as there are many styles of teaching, there are many styles of ALN teaching. ALN is a broad technology; it can work in many forms.

There is an enormous range of ways to convert a course to online form. If you insist that the course be full of gripping graphics you can make the process arbitrarily expensive. This gives rise to the notion that course conversion is expensive. When we started we provided $50,000 for course conversion; today we give $4,000–$12,000.

Interaction with the students is also different. Usually there is more interaction, and incautious professors who do not set rules for when they will answer e-mail find they have given themselves 24 hour/day jobs.

C. Consequences for Institutions
For institutions there are some inherent elements of economy since ALN reduces the need for buildings and related support. On the other hand there are costs of course conversion and the costs of computer and other support at the institution level. The bookkeeping of institutions of higher learning is so arcane that
trying to compare these different kinds of costs ends up being strongly detail dependant and not
particularly illuminating. If we compare courses with the same faculty/student ratio, which means
comparing courses with comparable quality, my best judgment today is that a reasonable approximation is
that costs are the same.

But if that is so what institutions are in a position to reach out to that new and larger market? Certainly it
is not easiest for top tier schools with large endowments. At such schools tuition covers only a fraction of
what the university spends per student. Adding more students, even at full tuition is often not
economically attractive. (A marginal analysis of the cost per additional student would be less negative as
it would not allocate the costs of supported research, buildings etc. to the cost per additional student.) This
is one of the interesting perverse results of alumni generosity, many universities are not profit making
institutions to which a larger market is attractive, rather they are subsidized institutions who lose money
on every student. They are therefore not in position to provide more, not less, for off campus degrees, but
so far it is the exception rather than the rule. It is the schools that rely mainly on tuition, or the schools
whose state support grows adequately with enrollments, including on line enrollments, that are able to
expand most easily. There are many schools in this position today; Drexel and Pace Universities are
examples of this. Whether state schools are or are not in this position depends on the details of how they
are supported. SUNY, the State University of New York State, which now has about 6,000 students
online, simply does not distinguish in its support; it gets the same amount for students on line as on
campus.

Aside from the economics, often there is something politically attractive about reaching out to every
corner of the state, and therefore such moves may well be state supported. This has been our experience
so far with the University of Illinois system.

Of course even in many schools that are heavily subsidized there are parts that are profit making and these
can grow through ALN. Schools of business or of Law are good examples. These are the areas that are
the most likely starting points for for-profit competitors. Phoenix, is a serious and real for profit venture
that gives mostly business degrees and has several thousand students on line.

What is the future of the profit-making sector within higher education? This leads into the general
questions of the effect of ALN on the structure of the entire higher education industry. At this point we
leave the domain of fact and definitely move into the realm of speculation. I believe it is a fact that ALN
is a significant new technology that will allow new and effective modes of teaching and of organization.
How this new technology will play out in this industry is, by contrast, very speculative. But I will give
you my best speculations.

V. EFFECTS OF ALN ON THE HIGHER EDUCATION INDUSTRY

When looked at the industry level the whole picture has a familiar ring. A new technology has arrived on
the scene. Typically lots of new providers appear rushing to take advantage of it. Often the current
providers are much slower to react, due to internal organizational and personal reasons, the fear of
cannibalizing their own businesses, or various forms of denial. It is typical that diesel locomotives were
introduced by General Motors, not by Baldwin Locomotive the leading provider of steam locomotives. It
is typical that Apple pioneered the PC, not IBM. Incidentally neither one is a leading provider of PCs
today since the criteria for success in this rapidly evolving area have changed again since the early days of
the industry. More recently still, Amazon pioneered selling books online, not Barnes and Noble.
New technologies usually succeed first in a niche where they have special advantages. For the steam engine the niche was pumping water out of the bottom of coalmines. For ALN the niche is learners whose location or life style allows no easy alternative. But having a niche to build on allows the technology to survive and grow and become more effective. In its improved form it may well penetrate a far larger market.

After a while in a new technology industry, especially if there are economies of scope or scale in what is being provided, there is a shakeout, many smaller firms disappear or are absorbed, and the industry takes on a more stable form. Entry of a new technology into an industry often brings in new providers, and new important names appear, and some names disappear or are diminished.

It is hard to forecast the impact of a new technology. Nevertheless I will describe a few plausible scenarios. These are more possibilities than predictions. One effect of this new learning technology is likely to be more competition at a national level. Phoenix is a national educator; UNext aspires to be one, as does Penn State. For many students the choice of locality for their education has always been and still is restricted. The demands of family, or of work, do not allow them to make an educational choice uninfluenced by nearness. ALN is likely to allow this group to choose from a much wider range of alternatives. There is also, and this is important, for the first time, the possibility of more comparable quality. The unsubsidized schools to date have not been the high quality schools. But that too may change, because the new method of instruction allows the Professor to not be a regular employee and to be anywhere. He or she could be a world-leading specialist in the area to be taught. We do not know today to what extent this approach will be successful. This is related to the fact that we don’t know today in what area people care mostly about course content or in what areas it is the credential that matters.

It is possible, though by no means necessary, that we will see a shift between subsidized and non-subsidized providers. Higher education today is almost always subsidized in the sense that it does not cover its expenses through its revenues. The subsidy may come from alumni and endowment or from the state, but there generally is a subsidy. There is a real possibility that the economics of ALN will enable unsubsidized and profit making providers to compete in a much broader way with the subsidized schools. This will be especially likely if the new providers master the ins and outs of this new approach while the older schools struggle slowly with the question of whether they really want this new stuff at all.

A. Combinations of Institutions

There can also be new combinations of institutions. The Sloan Foundation has supported an alliance of unions and phone companies called (NACTEL) National Advisory Coalition for Telecommunications, which is arranging courses to help workers in the telephone industry to make the transition from the analogue to the digital world. Pace University is providing the courses that lead to an Associate Degree in Telecomm. The union provides marketing to its nationwide 800,000 members, and the phone companies pay the tuition as part of their collective bargaining agreement with the unions, the Communication Workers of America and the International Brotherhood of Electrical Workers. This is an interesting combination of institutions. This program is just ramping up; there are about 500 in it in this its first year. However this is a program that enables PACE University to reach out to a truly vast new audience.

And even within the traditional academic sector, some alliances seem possible and useful. Carnegie Mellon has initiated collaboration with some community colleges. CMU developed a high quality ten-course certification in software engineering, which will be taught on line by community college faculty.
Carnegie Mellon envisages a close alliance with many community colleges. They will train and support community college faculty who will actually do the teaching. This could be an important model for many research institutions to interact with schools that have a teaching emphasis. But at present it is new and untried.

Alliances of many sorts are made possible by the abolition of distance, we cannot predict what will actually emerge, but the scene will change.

B. New Possibilities: Lifelong Learning

For the first time lifelong learning can be more than just a phrase but rather a real possibility for large numbers of people who want to learn but can not leave their jobs to do so. And also give a new meaning to the phrase lifelong learning by teaching outside the classroom a wide range of things that were never taught there in the first place. Those of us who have had some exposure to engineering often hear that what an engineer knows goes out of date in 5 years, or 3 years if you prefer. But what does this mean? If it means anything, it means that there has been so much progress in some areas that the new knowledge has become essential. But where is that progress made and where can it be acquired? Often this is not in academia. There are industries where academia leads and industries follow, but there are others where industry knowledge of what they are doing is far deeper, and what is taught in academia is a faint shadow. These new modes of learning open up the possibility of access to new knowledge whether its source is academia, industry, or anything else.

C. New Possibilities: Diversity

Another new possibility has to do with diversity. Diversity at universities has meant different things at different times. It has meant diversity of race, of socio-economic background, of geographic origin. But, we take for granted a remarkable homogeneity of age and experience, or lack of experience. This too can change. If ALN students are being educated along with traditional ones it becomes possible to have a diversity of ages and experience represented in the classroom. Our limited experience with this indicates that students find this very enriching.

Clearly it is also possible to have a lecture or lecture equivalent taught by someone the professor believes has something to say, wherever that person may be. This could be interaction about a particular business event, or how a scientific discovery was made, from those who were actually there.

Because of the possibility of such changes that improve quality, I believe it is wise for universities, even those who have no desire to reach out to more or different students, to understand, not ignore this new technology. And even beyond the quality issue, it is usually unwise to ignore a new technology that is having an impact in your industry. And I think that in this case understanding is more likely to come from activity rather than study. A few who have given courses on line on campus will usually understand the possibilities and limitations and usefulness, or lack of it, of this new instruction for their institution, far better than a committee set up to study the question. (Supplying educational material to some other course provider is does not qualify as gaining experience from this point of view.)

D. Learners

These changes brought about by new technology, which have both ups and downs in them for today's education providers are good for people who want to learn and for the country as a whole. The ability to
learn specialized skills at any time in one’s life will certainly be enhanced, and this will strengthen the productivity of our entire country. From the individual’s point of view it will never be too late to learn.

In some very limited sense learning has always been available to those who want to learn, and who will make the often-heroic effort required. History likes to dwell on people who were self educated, they learned on their own from a few books, struggled through snowstorms to the public library, or in a later epoch and on a larger scale, struggled through daytime jobs and then went year after year to night school. We don't hear about those who wanted to learn but couldn't because they chose not to take the time from caring for their families, or because there simply were no night schools where they were.

Today it is becoming possible to make learning something that can be done at a time and place of your own choosing; it can be done at home, but without the isolation of solitary learning. ALN can bring the support of classmates and of an instructor to you wherever you are. By making learning outside of the classroom less heroic, we can make it what it ought to be, an ongoing part of ordinary life.

VI. ABOUT THE AUTHOR

Ralph E. Gomory has been President of the Alfred P. Sloan Foundation since June 1989. Dr. Gomory received his B.A. from Williams College in 1950, studied at Cambridge University and received his Ph.D. in mathematics from Princeton University in 1954. He served in the U.S. Navy from 1954 to 1957.

Dr. Gomory was Higgins Lecturer and Assistant Professor at Princeton University, 1957-59. He joined the Research Division of IBM in 1959, was named IBM Fellow in 1964, and became Director of the Mathematical Sciences Department in 1965. He was made IBM Director of Research in 1970 with line responsibility for IBM's Research Division. He held that position until 1986, becoming IBM Vice President in 1973 and Senior Vice President in 1985. In 1986 he became IBM Senior Vice President for Science and Technology. In 1989 he retired from IBM and became President of the Alfred P. Sloan Foundation.

He has served in many capacities in academic, industrial and governmental organizations, and is a member of both the National Academies of Science and of Engineering. He has been awarded a number of honorary degrees and prizes including the Lanchester Prize in 1963, the John von Neumann Theory Prize in 1984, the IEEE Engineering Leadership Recognition Award in 1988, the National Medal of Science awarded by the President in 1988, the Arthur M. Bueche Award of the National Academy of Engineering in 1993, the Heinz Award for Technology, the Economy and Employment in 1998, the Madison Medal award of Princeton University in 1999, and the Sheffield Fellowship Award of the Yale University Faculty of Engineering in 2000. He was named to the President's Council of Advisors on Science and Technology in 1990 and served to March 1993.

Dr. Gomory is a director of The Washington Post Company, Lexmark International, Inc., and the Polaroid Corporation. Dr. Gomory's research interests have included integer and linear programming, network flow theory, nonlinear differential equations, and computers. In recent years he has written on the nature of technology and product development, research in industry, industrial competitiveness, technological change, and on economic models involving both economies of scale and technological change.
THE FUTURE OF THE UNIVERSITY IN AN AGE OF KNOWLEDGE

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ABSTRACT
We have entered an age of knowledge in which educated people and their ideas, facilitated and augmented by rapidly evolving information technology, have become not only key to our social well-being but are driving great change in all social institutions. Although the primary missions of the university—the creation, preservation, integration, transmission, and application of knowledge—are not changing, the particular realization of each of these roles is changing dramatically. So, too, is the nature of the higher education enterprise as it evolves into a global knowledge industry. We discuss the implications of these shifting paradigms for the university and conclude that higher education must evolve rapidly to create a culture of learning for our society, a culture in which educational opportunities become pervasive through the use of information technology.

KEYWORDS
Virtual University, University Change, Information Technology and University

I. INTRODUCTION
After fifteen years as an academic administrator, I was taken aback by a flyer posted near my faculty office that advertised the following curriculum:

Students will begin by learning the C++ programming language and corresponding operating system on their choice of platforms, including Unix, Macintosh, and Windows-NT on state-of-the-art systems including Pentium, Macintosh, Sun, and HP workstations and Convex Exemplar and IBM SP-2 supercomputers. In addition they will learn HTML, Javascript, and create a home page on the World Wide Web. They will explore computer graphics and animation, including still imagery and video with Macromedia Director and Photoshop. They will use these tools to explore the technological fields of robotics and artificial intelligence. [1]

This sounded rather advanced for college students, even at the graduate level. By then, as I read the fine print, I noticed that this poster was not aimed at college students. Instead it was advertising a summer camp run by our engineering college for high school students of ages 13 to 17!

Needless to say, this provided yet another data point that information technology was not only challenging and changing our institutions, but it was also changing substantially the knowledge base of the students entering our universities.

A. Time of Challenge and Change
We are living in the most extraordinary of times: the end of the Cold War, a redefinition of the world economic order, the impact of technologies ranging from computers and telecommunication to biotechnology, and, of course, a time in which the human population is pushing against the very limits of
the planet. Many believe that we are going through a period of change in our civilization just as momentous as that which occurred in earlier times such as the Renaissance or the Industrial Revolution—except that while these earlier transformations took centuries to occur, the transformations characterizing our times will occur in a decade or less!

This time of great change, of shifting paradigms, provides the context in which we must consider the changing nature of the higher education enterprise itself. We must take great care not simply to extrapolate the past but instead to examine the full range of possibilities for the future.

From this broader perspective, we find that four important themes are converging in the final decade of the 20th Century: a) the importance of knowledge as a key factor in determining security, prosperity, and quality of life; b) the global nature of our society; c) the ease with which information technology—computers, telecommunications, and multimedia—enables the rapid exchange of information; and d) the degree to which informal collaboration (networking) among individuals and institutions are replacing more formal social structures, such as corporations, universities, and governments.

We have entered an age of knowledge in which educated people and their ideas have become strategic commodities essential to our security, prosperity, and social well-being. But unlike other resources such as mineral ores, timber, and access to low-skilled labor, knowledge knows no boundaries. It is generated and shared wherever educated and creative people come together. It cannot be exhausted; the more it is used, the more it multiplies.

B. The Challenges to the University

Rapidly evolving information technologies are dramatically changing the way we collect, manipulate, and transmit knowledge. They have increased vastly our capacity to know and to do things. They allow us to exchange information, to communicate, and to collaborate free from the constraints of space and time. Needless to say, the implications of this technology for knowledge-intensive organizations such as universities are profound indeed.

One frequently hears the primary missions of the university characterized as teaching, research, and service. But, these activities can also be regarded as simply the 20th Century manifestations of the more fundamental roles of creating, preserving, integrating, transmitting, and applying knowledge. If we were to adopt the more contemporary language of information technology, the university might be regarded as a “knowledge server,” providing knowledge services (i.e., creating, preserving, transmitting, or applying knowledge) in whatever form needed by contemporary society.

From this more abstract viewpoint, it is clear that, while the fundamental knowledge server roles of the university do not change over time, the particular realization of these roles does change—and changes quite dramatically, in fact. Consider, for example, the role of “teaching,” that is, transmitting knowledge. We generally think of this role in terms of a professor teaching a class of students, who respond by reading assigned texts, writing papers, solving problems or performing experiments, and taking examinations. We should also recognize that classroom instruction is a relatively recent form of pedagogy. Throughout the last millennium, the more common form of learning was through apprenticeship. Both the neophyte scholar and the craftsman learned by working as apprentices to a master. While this type of one-on-one learning still occurs today in skilled professions such as medicine and in advanced education programs such as the Ph.D. dissertation, it is simply too labor-intensive for the mass educational needs of modern society.
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The classroom itself may soon be replaced by more appropriate and efficient learning experiences. Indeed, such a paradigm shift may be forced upon the faculty by the students themselves. Today's students are members of the “digital generation.” They have spent their early lives surrounded by robust, visual, electronic media—Sesame Street, MTV, home computers, video games, cyberspace networks, MUDs, MOOs, and virtual reality. They approach learning as a “plug-and-play” experience. They are unaccustomed and unwilling to learn sequentially—to read the manual—and are inclined to plunge in and learn through participation and experimentation. While this type of learning is far different from the sequential, pyramid approach of the traditional university curriculum, it may be far more effective for this generation, particularly when provided through a media-rich environment.

It could well be that faculty members of the 21st Century university will find it necessary to set aside their roles as teachers and instead become designers of learning experiences, processes, and environments. Further, tomorrow's faculty may have to discard the present style of solitary learning experiences in which students tend to learn primarily on their own through reading, writing, and problem solving. Instead, they may be asked to develop collective learning experiences in which students work together and learn together with the faculty member becoming more of a consultant or a coach than a teacher.

One can easily identify other similarly profound changes occurring in the other roles of the university. The process of creating new knowledge—of research and scholarship—is also evolving rapidly away from the solitary scholar to teams of scholars, perhaps spread over a number of disciplines. One might well question whether the concept of the disciplinary specialist is relevant to a future in which the most interesting and significant problems will require “big think” rather than “small think.” Who needs specialists in an age where intelligent software agents may soon be available to roam far and wide through robust networks containing the knowledge of the world, instantly and effortlessly extracting whatever a person wishes to know?

So too there is increasing pressure to draw research topics more directly from worldly experience and needs rather than predominantly from the curiosity of scholars. Even the nature of knowledge creation is shifting somewhat away from the analysis of what has been to the creation of what has never been—drawing as much on the experience of the artist as the analytical skills of the scientist.

The preservation of knowledge is one of the most rapidly changing functions of the university. The computer—or more precisely, the “digital convergence” of various media from print-to-graphics-to-sound-to sensory experiences through emerging virtual reality—will move beyond the printing press in its impact on knowledge. Throughout the centuries, the intellectual focal point of the university has been its library, its collection of written works preserving the knowledge of civilization. Today such knowledge exists in many forms—as text, graphics, sound, algorithms, and virtual reality simulations—and it exists almost literally in the ether, distributed in digital representations over worldwide networks, accessible by anyone and certainly not the prerogative of the privileged few in academe. The role of the library is becoming less that of collecting and more that of a knowledge navigator, a facilitator of retrieval and dissemination.

Finally, it is also clear that societal needs will continue to dictate great changes in the applications of knowledge it expects from universities. Over the past several decades, universities have been asked to play key roles in applying knowledge across a wide array of activities, from providing health care to protecting the environment, from rebuilding our cities to entertaining the public at large (although it is sometimes hard to understand how intercollegiate athletics represents knowledge application). It is difficult to imagine the roles society will ask the university to play in the century ahead; we can only be
certain they will be different from the roles we play today.

C. Changes in the Higher Education Enterprise

In the past, most colleges and universities served local or regional populations. While there was competition among institutions for students, faculty, and resources—at least in the United States—the extent to which institutions controlled the awarding of degrees, credentialing, led to tightly controlled competitive markets.

Today, universities are facing new competitive forces. As the need for advanced education becomes more intense, some institutions are moving far beyond their traditional geographical areas to compete for students and resources. There are hundreds of colleges and universities that increasingly view themselves as competing in a national or even international marketplace. Even within regions such as local communities, colleges and universities that used to enjoy a geographical monopoly now find that other institutions are establishing beachheads through extension services, distance learning, or even branch campuses. Furthermore, with advances in communications, transportation, and global commerce, several universities in the United States and abroad are increasingly viewing themselves as international institutions, competing in a global marketplace.

In a very real sense, higher education is evolving from a loosely federated system of colleges and universities serving traditional students from local communities into a rapidly expanding knowledge industry. Since nations throughout the world recognize the importance of advanced education, this industry is global in extent. With the emergence of new competitive forces and the weakening influence of traditional regulations, it is evolving like other deregulated industries e.g., communications or energy. It is strongly driven by changing technology. And as our society becomes ever more dependent upon new knowledge and educated people, upon knowledge workers, the knowledge business must be viewed clearly as one of the most active growth industries of our times.

Many in the academy would undoubtedly view with derision or alarm the depiction of the higher education enterprise as an “industry,” operating in a highly competitive, increasingly deregulated global marketplace. However this is nevertheless an important perspective that will require a new paradigm for how we think about post-secondary education.

1. Unbundling

The modern university has evolved into a monolithic institution controlling all aspects of learning. In a sense, the faculty has long been accustomed to dictating what it wishes to teach, how it will teach it, and where and when the learning will occur. Students must travel to the campus to learn. They must work their way through the bureaucracy of university admissions, counseling, scheduling, and residential living. If they complete the gauntlet of requirements, they are finally awarded a certificate to recognize their learning—a college degree.

Today, comprehensive universities—at least as full-service organizations—are at considerable risk. These institutions have become highly vertically integrated. They provide courses at the undergraduate, graduate, and professional level; support residential colleges; professional schools; lifelong learning; athletics; libraries; museums; athletics; entertainment; and on, and on, and on . . . . Yet today we are already beginning to see the growth of differentiated competitors for many of these activities. Universities are under increasing pressure to spin off or sell off or close down parts of their traditional operations in
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the face of this new competition.

The most significant impact of a deregulated higher education “industry” will be to break apart this monolith, much as other industries have been broken apart through deregulation. As universities are forced to evolve from “faculty-centered” to “learner-centered,” they may well find it necessary to unbundle their many functions, ranging from admissions and counseling to instruction to certification.

2. From a Cottage Industry to Mass Production

Higher education is one of the few activities which has yet to evolve from the handicraft, one-of-a-kind cottage industry mode to the mass production enterprise of the industrial age. In a very real sense, the industrial age has largely passed the university by. Faculty continue to organize and teach their courses much as they have for decades—if not centuries. Faculty members design from scratch the courses they teach, whether they be for a dozen or several hundred students. They may use standard textbooks from time to time—although most do not—but their organization, their lectures, their assignments, and their exams are developed for the particular course at the time it is taught. So too our social institutions for learning—schools, colleges, and universities—continue to favor programs and practices based more on past traditions than upon contemporary needs.

Universities—more correctly, their faculties—are skilled at creating the content for educational programs. Indeed, we might identify this as their core competency. But they have not traditionally been particularly adept at “packaging” this content for mass audiences. To be sure, many faculty have written best-selling textbooks, but these have been produced and distributed by textbook publishers. In the future of multimedia—Net-distributed educational services—perhaps the university will have to outsource both production and distribution to those most experienced in reaching mass audiences—the entertainment industry.

3. Restructuring

The perception of the higher education enterprise as a deregulated industry has several other implications. There are over 3,600 colleges and universities in the United States, characterized by a great diversity in size, mission, constituencies, and funding sources. Not only are we likely to see the appearance of new educational entities in the years ahead, but as in other deregulated industries, there could well be a period of fundamental restructuring of the enterprise itself. Some colleges and universities might disappear. Others could merge. Some might actually acquire other institutions.

A case in point: The Big Ten universities (actually there are twelve, including the University of Chicago and Penn State University) are already merging many of their activities, such as their libraries and their federal relations activities. They are exploring ways to allow students at one institution to take courses—or even degree programs—from another institution in the alliance in a transparent and convenient way. They are even working together to position themselves to provide educational services on a global scale.

One might also imagine affiliations between comprehensive research universities and liberal arts colleges. This might allow the students enrolling at large research universities to enjoy the intense, highly personal experience of a liberal arts education at a small college while allowing the faculty members at these colleges to participate in the type of research activities only occurring on a large research campus. Indeed, one might even imagine hostile takeovers, in which a Darwinian process emerges resulting in some institutions devouring their competitors. Such events have occurred in deregulated industries in the past, and all are possible in the future faced by higher education.
D. Some Operational Issues for Universities

All universities face major challenges in keeping pace with the profound evolution of information and its implication for their activities. Not the least of these challenges is financial, since as a rule of thumb, most organizations have found that staying abreast of this technology requires an annual investment roughly comparable to ten percent of their operating budget. For a very large campus, such as the University of Michigan, this can amount to hundreds of millions of dollars each year.

It seems useful to set out some possible guidelines for such investments, learned from many years of experience at Michigan and other universities:

1. Invest in “Big Pipes”

While the processing power of computers continues to increase, of far more importance to universities is the increasing bandwidth of communications technology. Clearly both Internet access to off-campus resources and intranet capability to link students, faculty, and staff together are the highest priority. The key theme will be connectivity, essential to the formation and support of digitally mediated communities.

Universities are straining to keep up with the connectivity demands of students. Today’s undergraduates are already spending hours every day interacting with faculty, students, and home while accessing knowledge distributed about the world. Simply keeping pace with an adequate number of modem ports to meet the demands of off-campus students for access to campus-based resources and the Internet is overloading many universities. Installing and maintaining a modern on-campus network—a “wire plant”—has become one of the most critical challenges facing most universities.

2. Strive for a Multi-Vendor, Open Systems Environment

Universities should avoid hitching their wagons to only one or two vendors. As information technology becomes more of a commodity marketplace, new companies and equipment will continue to spring forth. Furthermore, the great diversity in needs of various parts of the university community will require a highly diverse technology infrastructure. Humanists will seek robust network access to digital libraries and graphics processing. Scientists and engineers will seek massively parallel processing. Social scientists will likely seek the capacity to manage huge databases, (e.g., data warehouses and data-mining technology.) Artists, architects, and musicians will require multimedia technology. Business and financial operations will seek fast data processing, robust communications, and exceptionally high security.

It will be an ongoing challenge to link together these complex multi-vendor environments, characterized not only by different equipment being used for diverse purposes, but also diverse software and operating systems. For this reason, it is important to insist on open-systems technology rather than relying on proprietary systems. Fortunately, most information technology is moving rapidly away from proprietary mainframes (“big iron”) to client-server systems based on standard operating systems such as Unix or Windows-NT. There is a vast array of commercial off-the-shelf software available for such open systems. Furthermore, the emergence of open document formats as part of the Net has raised the compatibility level from the vendor nameplate to the browser level. Furthermore, as digital technology becomes increasingly ubiquitous, universities will face the challenge as to just what components they will provide and which should be the personal responsibility of members of the community. For example, while networks and specialized computing resources will continue to be the responsibility of the university, other digital devices such as personal communicators will almost certainly be left to individual students, faculty, or staff members.
3. Student Participation

There continues to be an ongoing debate about whether students should be required to purchase their own computers. In reality, the majority of students entering college these days already have computers. Universities should be prepared to support the personal computing efforts of students by providing robust network linkages both in residence halls and student commons areas. Furthermore, they should negotiate with community telecommunications companies—both telephone and cable television companies—to provide sufficient network communication ports to facilitate off-campus students.

Perhaps more controversial is the role that universities can play in negotiating deep discounts with hardware manufacturers for student personal computers. Local retailers will sometimes complain that this represents unfair competition (although, in reality, most will benefit significantly from subsequent software and peripheral sales). However one can make a strong case that universities have an obligation to assist students in acquiring the hardware and software increasingly essential for their education.

Even as personal computer technology saturates the student body, universities should continue to build and maintain public computer sites where students can have access to more powerful technology. In a very real sense, these computer cluster sites are becoming analogous to the role that libraries played in the past. They provide students not only with the technology necessary for their studies, but also serve as places to study, gather, and collaborate.

4. Cultural Issues

One of the important strategic issues facing most universities will be the degree to which the evolution of information technology should be carefully coordinated and centralized or instead allowed to flourish in a relatively unconstrained manner in various units. Perhaps because of our size and highly decentralized culture, at Michigan we have long preferred the “let every flower bloom” approach. More to the point, we have encouraged islands of innovation, in which certain units are strongly encouraged to move out ahead, exploring new technologies, perhaps moving into leadership roles and serving as pathfinders for the rest of the university. Yet another cultural issue involves just who within the university community will drive change. Our experience has been that it will not be the faculty or staff but rather the students. As members of the “digital generation,” they are far more comfortable with this emerging technology. Furthermore, they represent a fault-tolerant population, willing to tolerate the inevitable bugs in “Version 1.0” of new hardware and software.

As one example of this phenomenon, it is clear that many students are already moving rapidly to embrace Net-based learning and are taking increasing control of their own education. Although enrolled in traditional academic programs and participating in time-tested pedagogy such as lecture courses, homework assignments, and laboratory experiments, when unleashed many students approach learning in very different ways when they work on their own. They use the Net to become “open learners,” accessing world-wide resources and Net-based communities of utility to their learning objectives.

E. The Need for Experimentation

No one knows what this profound alteration in the fabric of our world will mean, both for the university and for our entire society. As William Mitchell, Dean of Architecture at MIT, stresses in his provocative Web-book, City of Bits, “the information ecosystem is a ferociously Darwinian place that produces endless mutations and quickly weeds out those no longer able to adapt and compete [2]. The real challenge is not the technology, but rather imagining and creating digitally mediated environments for the kinds of lives that we will want to lead and the sorts of communities that we will want to have.” It is vital
that we begin to experiment with the new paradigms that this technology enables. Otherwise, we may find ourselves deciding how the technology will be used without really understanding the consequences of our decisions. Some examples currently underway at the University of Michigan illustrate both the nature and scale of such experiments:

1. The Media Union [3]
At the University of Michigan we have just opened a new facility known as the Media Union, designed to be just such a laboratory, a test bed, for developing, studying, and implementing the new paradigms of the University enabled by information technology. It will give us the chance to try out different possibilities before they become widespread realities, helping us avoid potentially expensive or even dangerous mistakes while maximizing the extraordinary capacities of our new tools.

More specifically, this 250,000-square-foot facility contains almost 1,000 workstations for student use. It houses a 1,000,000 volume library, but perhaps more significantly, it is the site of several of our major digital library projects. It also contains a sophisticated teleconferencing facility, design studios, visualization laboratories, and a major virtual reality complex. Since art, architecture, and music students work side-by-side with engineering students, the Media Union contains sophisticated recording studios and electronic music studios. It also has a state-of-the-art sound stage for “digitizing” performances, as well as numerous galleries for displaying the results of student creative efforts. To respond to intense student interest and activity, the Media Union is open twenty-four hours a day, seven days a week, throughout the year.

2. The School of Information [4]
Several years ago, at the University of Michigan, we became so convinced of the potential impact of information technology for the future of our institution that we decided to launch an internal R&D operation to explore and develop various possible paradigms for a 21st Century university. Rather than building an independent research center, instead we decided to take our smallest academic unit, the former School of Library Science and put at its helm one of our most creative scientists, Dan Atkins, with the challenge of developing new academic programs in “knowledge management.” The result has been the rapid evolution—indeed, revolution—of this unit into a new School of Information.

Put simply, this school is committed to developing leaders for the information professions who will define, create, and operate facilities and services that will enable users, both as individuals and as members of teams, to create, access, and use information they need. It is leading the way in transforming education for the information professions through an innovative curriculum, drawing upon the strengths of librarianship, information and computer science, business, social sciences, organizational development, communication, and systems engineering. Its activities range from digital libraries to knowledge networks to virtual educational structures.

3. The Millennium Project [5]
Located in the Media Union is the Millennium Project, a research center bringing together leaders, faculty, and students to develop new paradigms for the University of the 21st Century. The Millennium Project is designed to go beyond theorizing to provide an experimental laboratory for the testing of innovations in teaching, research, outreach, and administration. In a sense, we hope the Millennium Project functions much as the famous Lockheed Skunk works, that every so often its hanger doors will open and something strange and exciting will be wheeled out and flown away. One of our early projects is the Michigan Virtual Automotive College.

In 1996 we participated in the creation of a new institution, the Michigan Virtual Auto College (MVAC), designed to explore the implications of digital technology for higher education. This is a collaborative effort among the University of Michigan, Michigan State University, the State of Michigan, the state’s other colleges and universities, and the automobile industry. It was formed as a private, not-for-profit, 501(c)3 corporation aimed at developing and delivering technology-enhanced courses and training programs for the automobile industry, including both manufacturing and supplier companies. The MVAC serves as an interface between higher education institutions, training providers, and the automotive industry. It facilitates transfer of credits between institutions for those participating in courses and training programs offered under its auspices. It is designed as a “green field” experiment where colleges and universities can come together to test capabilities to deliver their training and educational programs at a distance and asynchronously. It is hoped that MVAC will eventually serve as a platform for the State of Michigan to build an education export industry.

F. The Ubiquitous University

Clearly, rapid evolution of information technology poses many challenges and opportunities for the contemporary university. For most of the history of higher education in America, we have expected students to travel to a physical place, a campus, to participate in a pedagogical process involving tightly integrated studies based mostly on classroom-based pedagogy. Yet, as the constraints of time and space—and perhaps even reality itself—are relaxed by information technology, one might question the degree to which these contemporary models of the university will continue to be relevant.

Although the many challenges facing higher education in the digital age suggest strongly that the university will change—indeed, that it must change—in very fundamental ways, they do not suggest a particular form for future universities. Rather the great and ever-increasing diversity characterizing higher education in America makes it clear that there will be many forms, many types of institutions serving our society. But our discussions do suggest a number of themes that will likely characterize the higher education enterprise in the years ahead:

- **Lifelong Learning**, requiring both a willingness to continue to learn on the part of our citizens and a commitment to provide opportunities for this lifelong learning by our institutions
- **A Seamless Web**, in which all levels of education not only become interrelated, but blend together
  - **Asynchronous (anytime, anyplace) Learning**, breaking the constraints of time and space to make learning opportunities more compatible with lifestyles and needs
- **Affordable**, within the resources of all citizens, whether through low cost or societal subsidy
- **Interactive and Collaborative**, appropriate for the digital age, the “plug and play” generation
- **Diversity**, sufficient to serve an increasingly diverse population with diverse needs and goals

Yet there is an even broader theme: In the age of knowledge, it has become increasingly clear that not only has knowledge become the wealth of nations, it has also become the key to one’s personal standard of living, the quality of one’s life. Hence, we might well make the case that today it has become the responsibility of democratic societies to provide their citizens with the education and training they need throughout their lives, whenever, wherever, and however they desire it, at high quality, and at a cost they can afford.
Of course, this has been one of the great themes of higher education in America. Each evolutionary wave of higher education has aimed at educating a broader segment of society.

For the past half a century, national security was America’s most compelling priority, driving major public investments in social institutions such as the research university. Today, however, in the wake of the Cold War and on the brink of the age of knowledge, one could well make the argument that education will replace national defense as the priority of the 21st Century. Perhaps this will become the new social contract that will determine the character of our educational institutions, just as the government-university research partnership did in the latter half of the 20th Century. We might even conjecture that a social contract, based on developing the abilities and talents of our people to their fullest extent could well transform our schools, colleges, and universities into new forms that would rival the research university in importance.

Once again we need a new paradigm for delivering it to even broader segments of our society. Just as with other resources such as food, energy, and transportation that soon became necessities of modern life and therefore the responsibility of a society, today higher education itself has become a similar need.

Fortunately, today’s technology is rapidly breaking the constraints of space and time. It has become clear that most people can learn and learn well using distant-independent learning technology. The barriers are no longer cost or technology but rather perception and habit. But perhaps even an enterprise dominated by asynchronous learning—anytime, anyplace, for anyone—may be only a transitional stage to a more radical future for higher education. Perhaps a more appropriate future for higher education—indeed, all of education—is that of a ubiquitous, pervasive learning environment—everytime, everyplace, for everybody. Indeed, in a world driven by an ever-expanding knowledge base, continuous learning like continuous improvement has become a necessity of life.

Rather than “an age of knowledge,” perhaps we should aspire instead to building a “culture of learning,” in which people are continually surrounded by, immersed in, and absorbed in learning experiences. Actually, this is not far from the environment experienced by a very young child, in which every stimulus becomes a learning opportunity. Information technology has now provided us with a means to create learning environments throughout one's life. These environments are able not only to transcend the constraints of space and time, but they, like us, are capable as well of learning and evolving to serve our changing educational needs.

Perhaps the creation of these pervasive, ubiquitous cultures of learning is both the greatest challenge and the true future of the university.

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“FREE TRADE” IN HIGHER EDUCATION
THE META UNIVERSITY

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ABSTRACT
The Internet can be a tool for increasing access to education while also maintaining or improving the quality of students’ learning. But if information technology is “bolted onto” existing programs, instructional costs increase. Instead, higher education must learn to use technology to disaggregate and disintermediate some of its current instructional programs and to recombine the resulting components into more flexible services that can compete in an educational “free market.”

KEYWORDS
Distributed Instruction, Virtual University, Asynchronous Learning Networks, National Learning Infrastructure Initiative, Internet 2

I. INTRODUCTION

Only a few years have passed since modest federal investments in NSFNet provided leverage for a much larger total investment in campus-based network infrastructure. These investments by higher education and a few key federal and corporate partners were designed to enrich the nation’s research infrastructure, but they also quickly resulted in a range of unanticipated, broadly useful applications in the global academic community. The result was the first general purpose (global) Internet. Soon thereafter, the Internet became an integrated set of inter-networking resources and services based on open, de facto standards and offered by an array of competing providers in a commercial environment now exhibiting many of the features of a commodity market. The World Wide Web (Web) and its attendant browsers, with their origins also in the research and academic communities, catapulted the Internet to its current revolutionary status both as a social and an economic phenomenon.

In light of higher education’s role in the Internet revolution, it is ironic that instruction and curriculum—constituting colleges’ and universities’ core “business”—remain largely unaffected by the revolution. After a decade of serious technical and pedagogical experimentation, systemic change is finally in the air. Early projects that pointed the way included mega-projects such as Andrew at Carnegie-Mellon and Athena at MIT and a host of smaller projects, all partially and generously funded by Digital, IBM and other companies. Leading today’s systemic change are the Alfred P. Sloan Foundation’s Asynchronous Learning Networks grant program [1], EDUCOM’s National Learning Infrastructure Initiative [2], IBM’s Global Campus corporate/academic partnership [3], and the Western Governors’ University [4]. In various forms and degrees, these initiatives imagine a global educational “free trade” zone in which students can customize a personal educational program from a broad range of flexible and relevant educational opportunities unconstrained by geography and one-size-fits-all approaches to certifying educational accomplishment. Indeed, the metaphor of “free trade” is a useful starting point for a discussion of the role of information technology in educational change.
II. THE PROTECTIONIST PARADOX

Business gurus are quick to point out that companies with an eye on the future sometimes have to be willing to introduce new products that directly compete with their prevailing core products. This wisdom can be expressed in gustatory terms: “If you protect your bread and butter at the expense of innovative new dishes, a competitor is likely to eat your lunch.” But examples are more convincing than unappetizing metaphors, even if applying these examples to the mostly non-profit world of higher education requires caution. IBM’s attempt to protect its mainframe business is often cited as evidence that protecting key products against internal competition can lead to overall decline in the face of rapid free-trade advances in technology, componentization, and mass customization.

A. Business Example

As IBM was establishing a commanding market share for its new PC in the mid 1980s, its leaders decided to protect existing mainframe and minicomputer products by maintaining artificially high prices on IBM PCs and by constraining these PCs to take only partial advantage of the rapidly advancing microprocessor technologies being offered to their full advantage by PC-cloning companies. IBM’s PC business was forced to carry the baggage of existing products and old business practices to its eventual detriment—and to the detriment of the company’s overall bottom line. Similarly and in an approximately parallel time frame, protecting the mainframe against the internal competition of the RISC technology developed in IBM labs allowed other companies to develop a commanding lead in a new market in which IBM’s research had established a breakthrough lead.

The IBM PC business, started as an independent business unit, was not allowed to continue to develop on its own terms, and the RISC workstation business was constrained by existing products from the start. New leadership committed to vigorous re-engineering was required to dig the company out of the hole created approximately ten years ago by those executives who failed to realize that the role of business leadership is to create new wealth (new products), sometimes at the risk of placing existing wealth (products) in harm’s way.

B. The Main Premise

It’s time for colleges and universities to recognize that the Internet and its coming successor, Internet 2, can serve as a new educational infrastructure. All packets are equal on today’s Internet. In contrast, Internet 2 will offer, not only higher speeds and bandwidth, but the ability to differentiate selected packets—those encoding video or sound, for example—and to deliver them in a stream within guaranteed time limits. Internet 2 will be not just time independent, but attuned to any time dependencies of an application. The approximately 100 universities committed to its development are designing it to be, in part, a learning infrastructure to support new student-centered instructional offerings in direct competition with many of today’s educational products.

In the public mind, campus-based courses and their aggregation into baccalaureate and professional degree programs constitute the primary product offered by higher education. The contact-hour, classroom-based course is higher education’s bread-and-butter instructional product. Colleges and universities must confront the possibility that protecting the instructional status quo while trying to take instructional advantage of the network may be as problematic as protecting the mainframe against its internal PC competitor while expecting that same PC to compete in the open, commodity PC market.

Only by exposing traditional instructional programs to internally seeded competition will these
instructional programs in altered form thrive in the face of new external competition in the instructional “market.” This line of thought can be abstracted to the argument that only by trying to put an important service out of business through internally seeded competition will the provider of that service remain in business—albeit with a variation on the original service.

It will be instructive first to examine the generalized idea in an academic context outside the hallowed domain of the classroom. Two service organizations face a similar need to put themselves out of some of their present businesses. Both the library and the information technology support organization face increasing demand, increasing costs, and the need to change or abandon some of their key services in response to challenges being driven by digital technologies.

C. Service Examples
The printed word will persist and, along with it, the need to collect and index books and other printed artifacts of human inquiry. The on-line word is nevertheless easier to publish, store, retrieve, search, and analyze. On-line collections will proliferate. No research library, however, can long afford to pursue a parallel policy of comprehensively collecting just-in-case books and journals while also aggressively investing in on-line collections. Research libraries must learn to band together to divide and conquer their shared problem so that no single library is compelled to remain in the bankrupting business of being a just-in-case repository of a comprehensive collection of ever increasing printed and on-line materials. That is, research libraries must collectively learn to put themselves out of their present business of unilaterally investing in comprehensive institutional collections.

Mediation is another primary function in the library professions. Information technology presents new opportunities for disintermediation almost daily as new search engines and indexing schema are announced in the on-line community. Surely those who mediate between library patrons and the information they seek would be well advised to put themselves out of their present business by focusing instead on the leading edge of on-line mediation in order to advance continually the art of disintermediation—their new business.

In a similar manner, the information technology professionals who support “end users” should find ways to put themselves out of their current business. They should focus on deploying technology to disintermediate the labor intensive mediation services they now offer to help users make the most of their computer/network systems and applications. No institution or organization can long afford the rising costs of labor-intensive help desks and similar services as the complexity of computer and network systems increases and the demand for help spirals upward. (This near-crisis situation in campus information technology organizations is compounded by the academic tradition of trying to support too many different combinations of hardware and software.)

These examples illustrate the need for—but admittedly not a plan for—displacing some of today’s academic services with new ones. It is time to turn in greater detail to higher education’s core product: instruction.

III. DISTRIBUTED EDUCATION
It will be ironic if higher education, which pioneered the Internet and is helping to lead the way toward the next-generation Internet through the Internet 2 Project, fails to adapt its instructional programs to take advantage of the global network. Several opportunities come to mind:
• A college or university can reach new markets of learners by extending the reach of its instructional programs beyond the limiting campus boundaries of the classroom, library, and laboratory.

• Asynchronous communication technologies and emerging synchronous communication and application-sharing technologies (e.g., Internet 2) can be used to enrich student-to-student and instructor-to-student communication and collaboration.

• More responsibility for learning can be shifted to the student through the use of network-delivered immersion learning materials. Courseware, simulations, case studies and other instructional software can engage the full range of the student’s human senses and include some degree of self assessment. These possibilities can be captured in the term learningware to signify a shift in emphasis from teaching to learning.

• An institution can reduce or contain its overall instructional expenses by disaggregating its instructional programs to preserve and enhance core institutional strengths and otherwise to offer network access to necessary learningware and related expertise through contractual partnerships or outsourcing arrangements with other colleges, universities, and companies. Technology supports modularity and flexibility, and these in turn make it easier to customize instruction and to be explicit in choosing to offer or not to offer—perhaps to outsource instead—certain courses or even certain degree (major) programs.

A key word in each of the above declarations of opportunity is can. How to seize these opportunities is another matter. Programs such as EDUCOM’s National Learning Infrastructure Initiative, the Sloan Foundation’s Asynchronous Learning Network Program, and IBM Global Campus services are helping institutions engage the how.

The phrases distributed instruction and the more comprehensive distributed education better capture the implications of the new opportunities outlined above than do the phrases distance instruction and distance education which, in their frequent connotation of video delivery (interactive or not), seek primarily to remove the constraints of distance from the prevailing contact-hour lecture model of instruction and sometimes to relax the constraints of residency in degree programs. Distributed education encompasses distance education but reaches further to imagine a global disaggregation of instructional resources into modular components of excellence which can be reassembled by any organization in the “business” of certifying quality-assured learning accomplishment (certificates and degrees). The result should be a conveniently and affordably accessible, enriched educational environment that integrates the networked delivery of learningware and asynchronous and synchronous conversations within learning communities of student apprentices, their expert mentors, and their educational and career advisors. Distributed instruction is at the heart of a learning society—a society (organization, nation, state) governed by the democratizing principle that everyone will have affordable and convenient access both to the means to learn and to the opportunity to certify that learning occurred.

Society expects higher education to link its curricula more relevantly to social and economic needs. Society also expects higher education to become more flexible in its course and degree offerings in order to meet new educational needs. Rapid changes in the discipline areas of knowledge, along with rapid growth in the volume of the overall knowledge base, are fueling a growing emphasis on life-long learning and learning to learn. Moreover, not all students are interested in a residential experience. Many consumers of instruction express tightly focused, self-selected learning objectives. This is especially the case with non-traditional learners and life-long learners who may have legitimate educational needs neither relevant to, nor easily accommodated by, either the time-and-place constraints of traditional campus-based study or the time constraints of multiple-year degree offerings. The promise of distributed
education is to increase access to instruction, to enhance the quality of students’ learning, and to reap a better overall return on investments in education.

These ideas are not new. This author and many others have been writing about them for several years. Experiments abound, many focused by grant or business opportunities, such as the Sloan Foundation’s Asynchronous Learning Network Program and IBM’s Global Campus, both of which are viewed by higher education’s leadership chiefly as opportunities to reach new markets or to enhance service to primary markets. In contrast, the new Western Governors’ University is often perceived as a threat, primarily because it is not centered in existing educational institutions and because it plans to decouple instruction from the certification of learning. In other words, the prevailing instinct in higher education is to circle the wagons to protect existing instructional programs and models, rather than to seed internal changes possibly harmful to the status quo but designed to hasten the arrival of the learning society/economy envisioned by the Western Governors.

IV. QUALITY IS RELATIVE, NOT ABSOLUTE

Any attempt to marshal support for educational change must confront the fears that lead educators to resist change. These fears, whatever their true foundation, are usually expressed as concerns for the quality of education. Any discussion of quality, however, should be a discussion about trade offs—about how good is good enough. A new technology seldom replaces one human construct by another. Instead, a new technology usually offers new opportunities to trade off the relative advantages of one construct against another—the spoken word against the published word, the published word against the video experience incorporating the spoken word, and the sum of these against the new communication possibilities being shaped by the Internet and its coming successors. Some people choose TV news over the newspaper for the convenience of a summary report that can be digested with dinner. Others choose the newspaper for its depth of coverage. Still others choose both—and wonder why there is so little time in their lives. Modern life sometimes seems to be driven by the tyranny of trade offs! Here are some that concern educational quality.

A. Face to Face Versus Other Forms of Communication

People working together toward a common goal often face limitations of time and place. Advances such as the telephone, conference calling, and two-way videoconferencing have helped relax these constraints, though they cannot completely replace the advantages of face-to-face meetings—even as they mitigate some of the less pleasant disadvantages. The Internet offers a range of new communications opportunities to organize human activities on the basis of shared interests rather than proximity. Primary examples are the globally dispersed communities of scholars and researchers who share an intense interest in a highly vertical area of specialization. Along with providing time-independent asynchronous communication, the Internet lets these communities share globally distributed resources. Few scholars care whether these opportunities are better or worse in an absolute sense than face-to-face opportunities for collaboration. Most will continue to attend annual disciplinary society meetings and seize sabbatical opportunities to work person-to-person with colleagues at other institutions, while also participating fully in convenient and affordable electronic opportunities for collaboration.

A disciplinary listserv is an opportunity to expand a learning community of experts. A course is an opportunity to create a learning community of novitiates. This subtle distinction may explain why faculty members, as instructors rather than scholars, have been less creative in embracing the options provided by the Internet. The word Internet makes some instructors bristle, not because they fear the networked delivery of learning materials, but because they have justifiable concerns about a “wired” future that
diminishes the human connection between student and instructor. They do not wish to lose the conversational and social aspects of learning, which allow for rich sensory cues and spontaneous give and take. Face to face, humans switch tasks and modes of communication seamlessly, but today’s computers and network services do not support an integrated, seamlessly rich palette of communication and application capable of supplanting proximity. But in many educational contexts and for many learners, the implied trade off is entirely acceptable.

Even as emerging network technologies and applications (e.g., Internet 2) advance the electronic environment for communication and collaboration and thus the opportunity to create course-based distributed learning communities, there will remain institutions and students with a common interest in the prevailing campus-based model of education. Face-to-face instruction will continue to prevail in some forms of the residential experience at one extreme of the spectrum of distributed educational models. Even there, it is reasonable to question whether the contact-hour lecture and its adjunct office hour optimize the quality of the time an instructor spends with students. It is also reasonable to inquire about enhancing or cost-reducing roles for technology and about distributed education’s possibilities for sharing and outsourcing instructional resources.

B. Price As a Determinant of Quality

Many would argue that the reason for attending a prestigious liberal arts college or private research university as an undergraduate lies more in the delayed value of having gone there than in the education received while there. It is less a case of getting the education you pay for than of paying for what you really want: membership in a lifetime club which offers continuing social and economic advantages to its members. This argument ignores the strictly educational advantages that might reasonably be expected to accrue to a high tuition base, and is not meant to suggest that educational expenditures have no bearing on educational quality. But the trend toward distributed education is in part a response to the escalating cost basis of the traditional higher education enterprise and the possibilities for cost containment enabled by technology. Indeed, if the concept of a quality liberal education based on educational rather than socioeconomic precepts is to survive as a broadly available common-good privilege it must do so on terms that do not equate quality with price but instead seek to contain costs.

The challenge to institutions committed to an affordable baccalaureate experience incorporating general education requirements—especially if they are public institutions—is to harness some of the competitive advantages of distributed education. Can the network help deliver a better, faster, undergraduate experience? Doing so will be difficult as long as an institution insists that a one-size-fits-all, take-it-or-leave-it four-year degree program based on the contact hour and aggregating the goals of liberal education and the major is the only means for students to acquire a higher education. Surely some potential students will choose to leave it if they have alternatives which relax the limitations of requirements based, for example, on geography, residency, and time in a seat—the contact hour.

C. The Four-Year Undergraduate Experience Versus Other Educational Constructs

The heading above speaks to the degree to which higher education has aggregated its concepts of educational quality into a one-size-fits-all model with little room for variation. The four-year liberal arts education captures many prevailing ideas about educational quality. In a form that compromises only some of the advantages of a liberal arts college, this experience is a partially subsidized privilege widely available to students in most public universities. Even commuter campuses, which have largely abandoned the socializing overnight aspects of the residential experience, have not disaggregated the
other three essentially separable features of the prevailing undergraduate model: the four-year requirement based on the currency of semester or quarter hours, the contact-hour metric for measuring instructors’ time with students, and the classroom lecture for deploying that time.

Whatever the quality possible in the narrow range of variations on the prevailing undergraduate model, it is already a trade off against the one-to-one tutorial quality of the Oxbridge model in the interests of the institutional productivity and cost containment enabled by the mass-production classroom contact hour. How good is good enough?

Surely some institution will deploy the new human communications and content delivery potential of the networked computer to recapture many of the most desirable features of the Oxbridge model in a newly designed undergraduate experience. Perhaps this new program will be relaxed in its insistence that the classroom contact hour is the best use of instructors’ time with students and will be based on the idea of accumulating a portfolio of judged written and oral argument and problem solving experiences. Perhaps students will be expected to pass exit exams but will be free to prepare for these by drawing on a variety of network resources for self study and by joining a variety of supporting academic discussion groups anchored by disciplinary experts. Perhaps there will be no, or a reduced, residency requirement. Perhaps this program will pay attention to both breadth and depth but will confer a bachelor of arts and sciences degree, rather than a degree in one of large number of specific majors, and will be achievable for most students in less than four years.

Most important of all, it is time to recognize without prejudice that there are new and pressing educational needs that have little to do with the four-year undergraduate experience. Professional education has recognized this to some extent, and community colleges have been meeting many of these needs for years. More is needed, however, as the demand increases for just-in-time highly targeted education and training, on-the-job education, life-long recreational learning, and other educational opportunities. Mainstream higher education can choose either to participate in these opportunities as part of a growing globally distributed educational enterprise or to remain primarily dedicated to its current degree configurations based on a teaching infrastructure of classrooms and contact hours at the risk of becoming the teaching tail that does not wag the learning dog. Distributed education’s imperatives of disaggregation and disintermediation are keys to the new market-expanding possibilities for higher education.

V. NEXT STEPS TOWARD A DISTRIBUTED EDUCATION FABRIC

A. Disaggregation

Disaggregation has been a common thread throughout. Here are some key themes of disaggregation in summary form.

*Consider decoupling instruction and assessment.* The marriage of teaching and testing is more unnatural than natural from the perspective of instructor as mentor or guide. There are many instances when professorial time would be better spent in assessing an instrument of assessment that in assessing performance on that instrument. Indeed, there are already many instances of national or state professional “board” exams and national examination programs such as the Advanced Placement Program in which the ultimate assessment of accomplishment is independent of instruction and is not even linked to any particular instructional offerings. The opportunity is for institutions to be judged by the independently assessed accomplishments of their client learners, while displacing the labor costs associated with grading. The Western Governors understand the power of this idea.
Disaggregate the costs of instruction and curriculum. It is difficult to make judgments about academic program costs relative to program value. To do so requires identifying the true costs of academic programs. In particular, cross subsidies need to be identified and consciously continued or eliminated. For example, freshman math courses presently subsidize the Ph.D. program in math, and perhaps even in other disciplines, in many research universities. This may be good or bad. In any case, wise decisions about where to invest scarce resources require the explicit recognition of these kinds of cross subsidies which typically introduce static into discussions about new models for delivering instruction and certifying learning. For example, an attempt to alter the delivery model for elementary math courses at research universities can raise the question of how to support math Ph.D. students if not by paying them to teach these basic courses. Such questions may appear to be about priorities: to offer the best ratio of learning to instructional costs in elementary math courses or to preserve the Ph.D. program in math? But market forces are likely to overwhelm any attempt to protect the Ph.D. program in a basic academic discipline when the market for professors in that discipline will remain a buyer’s market for the long term. In any case, not to offer the best ratio of learning to instructional costs in elementary math courses in the emerging globally distributed educational market is to invite another institution or organization to compete and win your research university’s elementary math business—with a potential downside for the Ph.D. program anyway.

Disaggregate the various roles of the faculty. Although the role of the faculty varies by institutional type, there are some basic curriculum-related responsibilities common to the institutional expectations attaching to most faculty positions: organize and “package” knowledge for student learning through a course experience, deliver that knowledge in the course context, assess student performance, advise students on their educational and career goals, and formulate and govern institutional requirements for degree certification. Each faculty member may perform better in some of these roles than in others. Distributed education recognizes this and assumes that instructional professionals are deployed where need and talent intersect. For example, colleges and universities seldom invest in the development of curriculum materials—textbooks and learningware. Until they do or until the textbook publishing industry (or its Internet-age replacement) invests significantly in the development of network-delivered learning materials, distributed education cannot succeed on a large scale. Many believe that there will emerge “superstar” authors of learningware earning significant royalties from major learningware studios and not otherwise engaged in the instructional process. In any case, this is but one more example of the disaggregation of one-size-fits-all educational practices, not unlike the decoupling of the traditional faculty roles of instruction and assessment.

Consider decoupling general (liberal) education and the major. The dual requirements of breadth and depth are not necessarily justified by the goals of every educational program and the mission of every four-year institution. Decoupling these two sets of requirements at four-year institutions, when appropriate, could have the effect of reducing time to degree while offering some students educational opportunities more relevant to their career-driven aspirations and offering others a flexible approach to personal growth through the breadth of a general education. Indeed, there is a rising demand for general education as a life-long personal-growth pursuit and, thus, a new “market” for those institutions willing to embrace technology-enabled approaches to liberal education unfettered by the extremes of residency and time-to-degree requirements.

**B. Disintermediation**

The preparation and delivery of the contact-hour lecture is labor intensive and thus expensive. In contrast, there are many instances in which the networked delivery of the same content in the form of learningware could be more involving and engaging to the learner—a more compelling self-study environment than a textbook coupled with lecture notes. Bolting learningware onto the classroom lecture can enhance
learning, but only at added cost. The opportunity is to move away from the lecture by coupling self study with just-in-time Oxbridge-style intervention in the faculty office or through network communication tools. The development of self-study materials—learningware—and independently administered assessment vehicles could be leveraged across many institutions and millions of learners to contribute considerable savings to the overall national costs of instruction in many high-enrollment areas of study, such as the basic mathematical competencies. Almost every college and university currently incurs noticeable remediation costs which aggregate to a national cost of shameful proportion. A distributed educational fabric with its conveniently and affordably accessible resources could permit the large-scale outsourcing of remediation to those institutions and/or companies which choose to focus there.

C. Instructional Management System

Successful instruction results in learning and typically depends on more than the self study of learning resources such as textbooks or learningware. Instructors provide guidance, a framework for learning, and sometimes motivation. Instructors must have access to potential learning resources for pre-selection review based on their learning objectives for students. Resources must be selected and made available to students, for a fee or not. Assignments and schedules must be communicated to students. Instructors must diagnose student progress and intervene appropriately. Student-to-student and instructor-to-student communication must be available. These “instructional management” functions become extraordinarily important in a distributed educational environment in which learning resources, learners, and instructors might be distributed across the global network. This is the purpose behind the Instructional Management System (IMS) being developed under the aegis of EDUCOM’s National Learning Infrastructure Initiative as a set of protocols, middleware, and prototype client software. The IMS will be placed in the public domain, perhaps through the WWW Consortium, as a candidate for an open, evolving standard designed to seed the market for learningware by providing a common set of programming interfaces for the interoperability of modules developed by different parties. A range of commercial and no-profit parties are participating in the IMS project, which is described at http://www.imsproject.org.

D. Ubiquitous Network Access

Distributed education encompasses courses and curricula that utilize synchronous and asynchronous network communication tools and network-delivered learningware and other distributed instructional resources as an affordable means to increase access to education and to transfer more responsibility for learning to the student. The participants (learners, instructors/mentors, and advisors) and resources (learningware, library materials, laboratory instruments, for example) for a learning community may be distributed across the network and should be accessible to every participant from anyplace at anytime. Distributed education thus assumes convenient and affordable access to the Internet in the homes and workplaces of participants.

Most colleges and universities are moving rapidly to provide convenient access to their networks from any place on campus, but access from off campus is another matter altogether. Education is currently at the mercy of commodity Internet service providers who have yet to step up in any significant way to providing more than 28.8 kbs modem connections into the community at affordable prices. Even these connections are often tightly linked to a particular geographic region constraining the movement of those involved in a particular distributed learning community. This problem must be resolved if distributed education is to flourish.

The IBM Global Campus Program includes, among its other services, provision for connecting to IBM’s global network with its thousands of community access points to provide nearly universal access
opportunities for participating institutions and their students. The Internet 2 Project will expand the power of the communications internetwork among participating institutions and introduce new synchronous communications options. Two-way technology transfer is both an assumption and a goal of the project, and the hope is that technology transfer will result in new, advanced commodity network services into many local communities.

E. Collabotition

Few, if any, current institutions of higher education have the resources and expertise to create a comprehensive program of distributed educational opportunities. Institutions will have to divide and collectively conquer the problems of migrating to nationally and globally distributed network-based educational offerings if mainstream higher education is to participate in the growth of the educational mainstream. This collabotition—collaboration and competition—among institutions will have to include changes in policies that govern the inter-institutional exchange of academic and financial credits and a host of other business practices that are inimical to the success of distributed education. Educational free trade will require its counterpart to NAFTA. Courage will be required on the part of higher education’s leaders to begin to form the kind of partnerships of competitive convenience—the collabotive arrangements—that arise daily in the corporate community where the protectionist paradox is well understood and pre-competitive partnerships are an integral part of the competitive restructuring that is well underway.

VI. CONCLUSION: THE META UNIVERSITY

Technology can render irrelevant many of the traditions and practices that today protect weak along with strong instructional programs. The Western Governors’ initiative signals the disaggregation and disintermediation that is coming—free trade in an open higher education market. There will be many opportunities for shopping around for educational “components,” whether non-profit higher education participates or not. Few, if any, institutions will be self contained. Today’s strongest institutions will grow stronger by focusing resources on areas of excellence while outsourcing in weaker areas.

Strong and aggressive institutions and companies will band together into comprehensive meta universities—non-profit and for-profit brokers of comprehensive educational services predicated on an approach to quality control that is flexible enough to offer degrees or certification by reaggregating instructional and assessment offerings from many different sources. These meta universities will exist on the network whether or not they “own” the traditional educational infrastructure elements of classroom, library, laboratory, and faculty. Through its site on the network, a meta university will

- provide information about educational services provided by many partner institutions and companies,
- broker authenticated transactions for giving students access to those services, and
- maintain a database portfolio of accomplishment and certification for each of “its” students, perhaps with provision for the student’s record to be assembled in a variety of permutations as evidence of multiple, comprehensive educational accomplishments - degrees or certificates from participating organizations or from the meta university itself.

The paradox in all of this is that the costs and complexity of technology and the increasingly slim financial margins on which higher education will sink or swim demand, on the one hand, strong top-down coordination and inter-institutional collaboration to assure effectiveness and, on the other hand, investments in a bottom-up entrepreneurial environment to ensure that innovation and competition will
flourish. Or, in less paradoxical terms, the invisible hand of educational leadership will be required to ensure that technology-enabled innovation and competition create new national educational “wealth” rather than costly chaos within the higher education community.

Leadership external to higher education will also be needed. While a global free market in education is desirable, policy leaders such as the Western Governors should keep in mind that deregulation designed to open markets and encourage competition does not always lead to improvements in quality. Who enjoys sitting in a middle seat in coach class of a deregulated passenger-jet service? Unless the quality of learning is preserved or enhanced in the balance, it will not be in the national interest to increase access to education while also containing its cost.

VII. REFERENCES

3. http://ike.engr.washington.edu/ige

VIII. ABOUT THE AUTHOR

Bill Graves earned a Ph.D. in mathematics from Indiana University in 1966. In 1967, he joined the faculty at the University of North Carolina at Chapel Hill, where he is Professor of Mathematics and Professor of Information and Library Science. He has served the University in various capacities, including two terms as Associate Dean for General Education, an interim term as Vice Chancellor for Academic Affairs, and a five-year term as Associate Provost for Information Technology. Today he is serving as interim Chief Information Officer in a new position created to consolidate all central information technology services. He also conceived and is responsible for the University’s Institute for Academic Technology, a national educational technology center which receives partnership support from IBM and other profit and non-profit organizations. He chairs the planning committee for EDUCOM’s National Learning Infrastructure Initiative and is an elected member of the Board of Directors of CAUSE. He serves on the steering committee for the Internet II Initiative and chairs its Applications Working Group. Professor Graves writes and edits extensively on the role of information technology in higher education (http://www.iat.unc.edu/publications/graves/graves.html) and has given hundreds of invited presentations on the subject.
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, and 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, and how 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.
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,
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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.

<table>
<thead>
<tr>
<th>Input Measurement</th>
<th>Characteristics and assumptions of traditional residential institutions of higher education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philosophy</td>
<td>Students come to campus</td>
</tr>
<tr>
<td>Mission</td>
<td>Mission defined by level of instruction—offering graduate level programs often implies increased quality, as does student and faculty selectivity</td>
</tr>
<tr>
<td>Funding</td>
<td>Measured by $ expended per full-time student equivalent</td>
</tr>
<tr>
<td>Curricula</td>
<td>Relatively stable and comprehensive curriculum</td>
</tr>
<tr>
<td>Instruction</td>
<td>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</td>
</tr>
<tr>
<td>Faculty</td>
<td>Full-time faculty; faculty preparation and credentials, research productivity, and external grants imply increased instructional quality</td>
</tr>
<tr>
<td>Students</td>
<td>Greater selectivity at admission suggests higher quality programs—very little measurement of change in overall learning from entry to exit</td>
</tr>
<tr>
<td>Library</td>
<td>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)</td>
</tr>
<tr>
<td>Learning</td>
<td>Generally used to supplement or enhance lecture format; tiered high technology</td>
</tr>
<tr>
<td>Technology</td>
<td>Lecture halls are one example</td>
</tr>
<tr>
<td>Physical Facilities</td>
<td>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</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Productivity Outcomes</th>
<th>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</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governance</td>
<td>Independent Board of Trustees—Independence from political or business environment is a goal</td>
</tr>
<tr>
<td>Accreditation</td>
<td>Institutional by region; individual programs or disciplines are also accredited by professional accreditation associations</td>
</tr>
</tbody>
</table>

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% did not offer and did not plan to offer distance education courses in the next
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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.

<table>
<thead>
<tr>
<th>Input</th>
<th>Traditional universities</th>
<th>Extended traditional universities</th>
<th>For-Profit adult-centered universities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philosophy</td>
<td>Students come to Campus</td>
<td>Campus goes to students</td>
<td>Campus and non-campus philosophy</td>
</tr>
<tr>
<td>Mission</td>
<td>Mission defined</td>
<td>Externally focused,</td>
<td>Almost exclusively workforce</td>
</tr>
</tbody>
</table>
### Table 2. Comparison of For-Profit Adult-Centered Universities, Extended Traditional Universities, and Traditional Residential Universities

<table>
<thead>
<tr>
<th>by level of instruction</th>
<th>degree completion and workforce development</th>
<th>focused</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding</td>
<td>$ per full-time student</td>
<td>More self-sustaining and market driven</td>
</tr>
<tr>
<td>Curricula</td>
<td>Relatively stable &amp; comprehensive curriculum</td>
<td>More flexible curriculum content for workforce competence and development</td>
</tr>
<tr>
<td>Instruction</td>
<td>Most courses are lecture based</td>
<td>Greater variety of methods and use of student experience</td>
</tr>
<tr>
<td>Faculty</td>
<td>Primarily full-time faculty; academic preparation and credentials,</td>
<td>Greater use of adjuncts with professional experience</td>
</tr>
<tr>
<td>Students</td>
<td>Selectivity at admission</td>
<td>Life and work experience is greater factor in admission</td>
</tr>
<tr>
<td>Library</td>
<td>Volumes in library</td>
<td>Access to specific documents and resources appropriate to program</td>
</tr>
<tr>
<td>Learning Technology</td>
<td>Enhance lecture-oriented instruction</td>
<td>Both lecture oriented and used to extend access</td>
</tr>
<tr>
<td>Physical Facilities</td>
<td>Extensive physical Plant</td>
<td>Still campus based but less reliance on physical plant</td>
</tr>
<tr>
<td>Productivity Outcomes</td>
<td>Student credit hours and degrees.</td>
<td>Student credit hours and degrees</td>
</tr>
<tr>
<td>Governance</td>
<td>Board of Trustees</td>
<td>Board of Trustees</td>
</tr>
<tr>
<td>Accreditation</td>
<td>Institutional by region; individual programs or disciplines are also accredited</td>
<td>Institutional by region as part of parent organization's accreditation; individual programs or disciplines are also accredited</td>
</tr>
</tbody>
</table>

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 part-time 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% 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
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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.

<table>
<thead>
<tr>
<th>Input</th>
<th>Traditional universities</th>
<th>Extended traditional universities</th>
<th>Distance education/technology-based universities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philosophy</td>
<td>Students come to campus</td>
<td>Campus goes to students</td>
<td>Campus goes to students</td>
</tr>
<tr>
<td>Mission</td>
<td>Mission defined by level of instruction</td>
<td>Externally focused, degree completion and workforce development</td>
<td>Externally focused, degree completion and workforce development</td>
</tr>
<tr>
<td>Funding</td>
<td>$ subsidy per full-time student</td>
<td>More self-sustaining and market driven</td>
<td>Reduce cost of access to higher education</td>
</tr>
</tbody>
</table>

160
<table>
<thead>
<tr>
<th>Curricula</th>
<th>Relatively fixed &amp; comprehensive curriculum</th>
<th>More flexible curriculum content for workforce competence and development</th>
<th>More flexible curriculum-content for workforce competence and development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instruction</td>
<td>Most courses are lecture based</td>
<td>Greater variety of methods and use of student experience</td>
<td>Varies by type, See Table 5</td>
</tr>
<tr>
<td>Faculty</td>
<td>Primarily full-time faculty; academic preparation and credentials,</td>
<td>Greater use of adjuncts with professional experience</td>
<td>Some use of full-time faculty but with greater use of adjuncts with professional experience</td>
</tr>
<tr>
<td>Library</td>
<td>Volumes in library</td>
<td>Access to specific documents and resources appropriate to program</td>
<td>Access to specific documents and resources appropriate to program</td>
</tr>
<tr>
<td>Students</td>
<td>Selectivity at admission</td>
<td>Life and work experience is greater factor in admission</td>
<td>Life and work experience is greater factor in admission</td>
</tr>
<tr>
<td>Learning Technology</td>
<td>Enhance lecture-oriented instruction</td>
<td>Both lecture oriented and used to extend access</td>
<td>Varies by type, See Table 5</td>
</tr>
<tr>
<td>Physical Facilities</td>
<td>Extensive physical plant</td>
<td>Still campus based but less reliance on physical plant</td>
<td>No physical plant—students are geographically separated from each other and the instructor</td>
</tr>
<tr>
<td>Productivity Outcomes</td>
<td>Student credit hours and degrees</td>
<td>Student credit hours and degrees</td>
<td>Varies by type, See Table 5</td>
</tr>
<tr>
<td>Governance</td>
<td>Board of Trustees</td>
<td>Board of Trustees</td>
<td>Varies by type, See Table 5</td>
</tr>
<tr>
<td>Accreditation</td>
<td>Institutional by region; individual programs or disciplines are also accredited</td>
<td>Institutional by region; disciplines and programs also part of parent organization's accreditation</td>
<td>Varies by type, See Table 5</td>
</tr>
</tbody>
</table>

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 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
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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 asynchronous interaction 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.

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

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.
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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.

<table>
<thead>
<tr>
<th>Input</th>
<th>Extended traditional universities</th>
<th>For-Profit adult-centered universities</th>
<th>Corporate universities</th>
<th>University/industry strategic alliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philosophy</td>
<td>Campus goes to students</td>
<td>Campus and non-campus philosophy</td>
<td>Campus and non-campus philosophy</td>
<td>Campus goes to students</td>
</tr>
<tr>
<td>Mission</td>
<td>Externally focused, degree completion and workforce development</td>
<td>Almost exclusively workforce focused</td>
<td>Exclusively workforce focused on corporation needs</td>
<td>Externally focused, degree completion and workforce development</td>
</tr>
<tr>
<td>Funding</td>
<td>Largely self-sustaining and market driven</td>
<td>Market driven, workforce focused, and profit driven</td>
<td>Funded by corporation--centrally or by department assessment</td>
<td>Market driven, workforce focused, and entrepreneurial but not necessarily profit driven</td>
</tr>
<tr>
<td>Curricula</td>
<td>More flexible curriculum content for workforce competence and development</td>
<td>Focused on workplace needs; adult oriented</td>
<td>Build corporate citizenship and employee skills</td>
<td>Adult workforce competence and development</td>
</tr>
<tr>
<td>Instruction</td>
<td>Great variety of methods and use of student experience</td>
<td>Methods typically standardized across locations</td>
<td>Methods typically standardized across locations</td>
<td>Typically custom designed for market; use of instructional design teams</td>
</tr>
<tr>
<td>Faculty</td>
<td>Great use of adjuncts with professional experience</td>
<td>Usually staffed with part-time faculty with professional experience</td>
<td>Usually staffed with part-time faculty with professional experience</td>
<td>Combination of faculty with special expertise and practicing professionals</td>
</tr>
<tr>
<td>Students</td>
<td>Life and work experience is significant factor</td>
<td>Life and work experience is significant factor</td>
<td>Generally required to be employed by</td>
<td>Targeted groups of students, usually employed adults</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Library</th>
<th>in admission</th>
<th>corporation</th>
<th>in admission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to specific documents and resources appropriate to program</td>
<td>Access to specific documents and resources appropriate to program</td>
<td>Access to specific documents and resources appropriate to program</td>
<td>Access to specific documents and resources appropriate to program</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Learning Technology</th>
<th>Both lecture oriented and used to extend access</th>
<th>Technology a method of reducing costs</th>
<th>technology enables crossing boundaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student credit hours and degrees.</td>
<td>Bottom line is profitability</td>
<td>Profitability and contribution to bottom line of corporation</td>
<td>Profitability a primary concern, also innovation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Governance</th>
<th>Board of Trustees</th>
<th>Board of Directors</th>
<th>Directed by Corporation</th>
<th>Limited liability companies</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Accreditation</th>
<th>Institutional by region</th>
<th>Institutional by region</th>
<th>Institutional by region--Many not yet accredited</th>
<th>University brings its accreditation to the alliance</th>
</tr>
</thead>
</table>

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.

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

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
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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.

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VI. ABOUT THE AUTHOR

Donald E. Hanna received his Ph.D. in Adult and Continuing Education from Michigan State University in 1978. He is currently Professor of Educational Communications, University of Wisconsin-Extension. His areas of teaching and research interest include learning technologies, distance education, continuing education, and organizational change.

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.

From 1987-1990, he was a Kellogg National Fellow and pursued the study of telecommunications policy and applications of telecommunications that benefit developing countries. In 1989 he received a fellowship from the Annenberg Communications Policy program in Washington, D.C.

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.
USING ALNS TO SUPPORT A COMPLETE EDUCATIONAL EXPERIENCE

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ABSTRACT
The most obvious factor influencing students’ satisfaction with distance learning is convenience of access. While ALNs clearly can provide convenient access to educational content, how do they measure up in terms of access to the broader range of elements that make up a “complete” educational experience?

Within traditional education, a complete education has been viewed as inseparable from the resident experience, with its access to instructional as well as co-curricular activities and support services. ALN programs that hope to meet the educational—rather than merely informational—needs of distant students must find ways to offer comparable opportunities and services.

Penn State’s World Campus is working to realize the potential of ALNs by using innovative strategies for meeting several specific objectives. These objectives include access to high-quality course content; interactions between faculty members and students beyond those in direct instruction; interaction among students at the program level; broad access to information and instructional resources; flexible access to appropriate support services; and developing students’ feeling of “belonging” to the institution.

This paper provides specific examples of online strategies for meeting these objectives and reports preliminary evaluation results relating to student satisfaction in courses offered during the first two semesters of World Campus programming.

KEYWORDS
ALN, Penn State World Campus, Student Satisfaction, Online Learning Communities, Evaluation

I. INTRODUCTION
In September 1996, The Pennsylvania State University, a pioneer and national leader in distance education, announced its intention to create a new distance education “campus” that would use innovative learning technologies to serve adult students at a distance. The Penn State World Campus would become the University’s 25th campus, providing access to undergraduate and graduate degree and certificate programs and just-in-time professional development programs. With support from the Alfred P. Sloan Foundation, the World Campus opened in January 1998 with a pilot offering of four courses.
Since January 1998, the World Campus has received almost 7,000 inquiries, which have generated nearly 600 program admissions. In academic year 1998-1999, the World Campus is offering its first full year of programs with 33 courses in 11 certificate and degree programs, including programs in Geographic Information Systems, Business Logistics, Customer Relations, Turfgrass Management, Educational Technology for Teachers, Dietetics, and Hotel and Restaurant Management.

II. A STARTING POINT FOR UNDERSTANDING STUDENT SATISFACTION

The World Campus is envisioned as the mechanism by which Penn State will respond to the lifelong learning needs of adults by using asynchronous learning technologies and pedagogies to extend the University’s academic resources to learners worldwide. Integral to the long-term success of this vision is the development and delivery of programs that students perceive as appropriately meeting or satisfying their educational needs.

The multiple-media ALN environment differs in significant ways from more traditional distance education contexts, and these differences have implications for student satisfaction. However, the newness of this practice environment meant that initially there was little direct knowledge of factors contributing to student satisfaction with ALN courses on which to base course and program design. As a result, guiding assumptions about student satisfaction were based on Penn State’s own experience with older forms of distance education (correspondence study; audio- and videoconferencing; and satellite transmission, for example); on the literature relating to general distance education practice; and on the results of market research with prospective students.

The assumptions discussed below provided the starting points and guides to the early design of programs and support systems. Concurrently, however, strategies for the extensive and continuing evaluation of World Campus programming were implemented and are now providing direct student feedback that has largely confirmed these early assumptions about student satisfaction while also providing a wealth of information on which to base improvements to programs and processes.

III. ASSUMPTIONS ABOUT STUDENT SATISFACTION WITH ALNS

The following assumptions guided the design of the initial World Campus programming, which represented three areas of study: Noise Control Engineering, Turfgrass Management, and Chemical Dependency Counseling. Because their validity has been supported by formal assessment activities, they continue to inform the design of courses, programs, and learner support.

A. Assumption 1: Student Satisfaction Is Related To Convenience And Quality Of Programs

Many adult students choose distance study because barriers—such as location, lack of time, and multiple roles—block their enrollment in on-campus courses or programs. Geographic distance from a higher education institution is a major barrier to conventional study. In a study of distance students at four universities, distance from campus was viewed as “very important” or “somewhat important” by 75% of those surveyed [1].

Increasingly, students are reporting that their motivation to study online comes from feeling time-bound, even more than from being place-bound. In the one study, 95% of the respondents identified time
constraints as a “very important” or “somewhat important” barrier to resident instruction. Similar findings have been reported by other researchers [2]. The multiple roles that most students fill contribute to their sense of being time-bound. Many students, particularly women, are unable to fit conventional study, with its rigid scheduling and often inconvenient location, into schedules that are already overburdened. As a result, access that is not limited by geography or an institution’s inflexible business hours can be a significant factor in students’ overall satisfaction with an educational program [3, 4, 5].

Although students want their access to programming to be different (that is, more flexible) than that which characterizes resident instruction, they do not want any differences in the quality of instruction. Research suggests that the quality of content, instruction, and support are major factors in student satisfaction with distance learning [6]. This perspective provides the basis for the second assumption guiding World Campus program design.

B. Assumption 2: To Meet The Needs Of Distance Learners, ALNs Must Provide A “Real” Educational Experience

The needs of distance learners are similar to those of traditional students. Distance learners need access to an educational experience that goes beyond access to content; they need a learning environment that connects students to content, to expert instruction, to a wide range of instructional resources, to their peers, and to appropriate support services. The World Campus is committed to the belief that all students, even those separated from each other and from the traditional campus by geographic distance, deserve the benefits of such a learning community.

C. Assumption 3: An ALN Learning Community Offers A Multi-Faceted Learning Environment That Meets Objectives It Shares With Resident Instruction:

- Appropriate academic content
- Interaction/engagement with course content
- Interaction with faculty outside of the “classroom”
- Out-of-class interaction among students in the same program
- Access to a broad range of instructional and informational resources
- Access to academic advising and other appropriate support services
- A feeling of “belonging” to the university community

Realistically, not all learners will identify each of these elements as crucial elements in their learning experiences. Research and experience both suggest, for example, that interaction with instructors may be more important to many distance learners than is interaction with their peers. Additionally, some learners would prefer to maximize the flexibility of their learning experiences by “opting out” of collaborative projects or peer interactions that require the coordination of schedules [7]. However, such course design decisions should reflect a balance between the needs of multiple stakeholders: the learner’s need for control [8], the faculty member’s need to ensure effective instruction and learning, and the institution’s need to fulfill its mission or to maintain credibility with regulatory bodies, for example.

Of course each ALN course does not need to incorporate all of the above elements, any more than all on-campus courses do; decisions on this point will be made on the basis of pedagogical considerations.
However, the power and flexibility of ALNs are allowing the World Campus to develop a design framework that ensures that a student’s overall program of study will offer numerous opportunities to participate in a learning community.

D. Assumption 4: The Infrastructure To Support ALNs In Higher Education Must Be As Solid As—But May Differ From—That Supporting Resident Instruction

A real university education offered at a distance needs a design, delivery, and support infrastructure that is at least as solid as that supporting resident instruction. This is true from both an “institutional positioning” perspective and from a “service-to-students” perspective.

Institutionally, recognition by a university’s “mainstream” that ALN providers such as the World Campus are able to both reflect and contribute to the mission and reputation of the university depends on being able to demonstrate complete and appropriate service to students. The service-to-students perspective reflects the fact that much that happens naturally in face-to-face instruction through the mere fact of bringing people together in one place must be more intentionally designed, facilitated, and supported in the ALN environment. Course design structures and institutional processes need to work together to bridge the physical and psychological distance that separates instructor from learners and learners from each other.

IV. REACHING THE OBJECTIVES OF A LEARNING COMMUNITY

A number of structures and processes have been developed by the World Campus to reach the objectives identified above.

A. Appropriate Academic Content

This objective is met by having faculty members and appropriate governing bodies make decisions relating to academic content. Because World Campus courses are taught by regular Penn State faculty members, and because courses and programs must undergo the same approval processes required in resident instruction (e.g., approval by the Faculty Senate or Graduate Council), World Campus students can be assured that the content they are taught is of the same quality as that offered in resident instruction. One result of this focus on content parity is that credit courses taken through the World Campus are not distinguished in any way from resident courses on a student’s transcript.

B. Interaction/Engagement with the Course Content

Reflecting the University’s commitment to active, collaborative, relevant learning, World Campus courses use ALN strategies to engage students in the teaching-learning transaction. Team projects focused on critical thinking and the application of problem solving skills; collaborative assignments; assignments tailored to students’ work situations; and interactive quizzes are strategies intended to increase the depth of student interaction with course content.

C. Interaction with Faculty Outside of the “Classroom” and with Students in the Same Program

A learning community offers more than transmission of information and ideas; it also offers a way of
establishing connections between people. In the World Campus, instructors help students form these connections through audio-conference calls to introduce themselves or as a way for teams to get to know each other. E-mail interactions also support connectedness, as does the Program Office feature, which offers students who are in the same program, but perhaps not in the same class, a space to meet and “chat” about issues that cut across courses or about other topics of mutual interest.

D. Access to Instructional and Informational Resources

Connectedness to a larger learning context is also reflected in students’ access to a broad range of resources. Computer conferencing allows faculty members to provide World Campus students with opportunities to interact with content experts from either the physical campus or around the world. Guest “speakers” can provide an advance set of readings for discussion or make an online presentation, then be available to answer questions or participate in online discussions over a period of several days. World Campus courses provide course-specific and disciplinary electronic links to libraries and other data collections that offer students access to vast collections of information. From these and other sources students can gather the raw materials they need to develop a personal knowledge base and a coherent approach to their program of study. Figure 1 offers a screen shot of a Program Office Home Page, the entryway to a variety of instructional resources and support options.
E. Access to Academic Advising and Other Support Services

The objective of ready access to suitable academic advising and support services is to ensure that students receive the guidance and personal support required to complete their programs in a successful and timely manner. In the World Campus, faculty members or staff advisers conduct individual academic counseling sessions via telephone or electronic mail. Policies, procedures, and information related to general administrative functions are accessible on line at the student’s convenience. Detailed course and program information (i.e., description, admission requirements, equipment requirements and costs) is also available on line, and students may register, order their textbooks, and pay their tuition and fees electronically. In the area of learner support, the goal continues to be to automate as many elements as possible and to develop “self-help” strategies that will release staff to attend personally to those situations where a “high-touch” approach is more appropriate. Figure 2 provides a schematic representation of the World Campus online student environment, which reflects a broad range of learner support services.

![On-line Student Environment](image)

**Figure 2. World Campus Support Services.**

F. A Feeling of “Belonging” to the University Community

The objective of identification with Penn State is to provide students with an educational experience that reflects connection to the history, reputation, personnel, and resources of the University. For World Campus students, this feeling of connection is fostered through initial and continuing communications that reflect the institution’s commitment to a relationship that goes beyond academic contact. Official correspondence establishes a sense of institutional identification through welcoming messages and communications of interest about the University. Prominent display of Penn State logos and other identifying symbols on all communications, including course materials, also helps to establish a student’s
identity as a “Penn Stater.” Electronic links to online tours of campus landmarks and to University publications such the student-published newspaper the Daily Collegian provide informative—and entertaining—ways of establishing a sense of identification with the University.

V. EVALUATING STUDENT SATISFACTION

The overall World Campus evaluation project attempts to answer six questions relating to access, student performance and satisfaction, faculty experiences, and financial viability. The following two questions focus most directly on the issue of student satisfaction:

- Does the World Campus increase access for learners through the use of a variety of distance education delivery modes?
- How satisfied are World Campus learners with the ALN environment and their learning experiences?

Evaluation results reported here are based on data gathered from students in the first two semesters of course offerings through interviews, a brief mid-course survey focused on factors influencing students’ choice of the World Campus, and an end-of-course survey. The interview data, because of its depth and richness, has been particularly helpful in providing feedback on which to base improvements in processes and products. However, because the population of students is still small, and the initial response rate to the end-of-course survey has to date been low, conclusions drawn from early evaluation data must remain tentative until a larger population of students and strategies for increasing the response rate offer more data.

A. Preliminary Results

Students have generally been positive in their assessment of their ALN experiences. From the feedback provided, we have identified both enhancers of and detractors from student satisfaction with the World Campus courses.

1. Enhancers
   - Removal of geographic barriers to participation in higher education
   - Mitigation of situational barriers
   - High quality course content
   - Opportunities for career development/possibility for promotion
   - Name value of Penn State
   - Level of interaction with faculty and World Campus Learner Support unit
   - Use of technology in the course (as an enabler, not an end in itself)

2. Detractors
   - Technical difficulties (browser, ISP problems)
   - Course workload (time requirements beyond expectations)

In general, early evaluation results confirm initial assumptions regarding the importance to students of
convenience, quality, and opportunities for interaction. Additionally, this group of students stressed the importance of career considerations and the reputation of Penn State in the workplace in influencing their choice to participate in World Campus programs and in their satisfaction with their courses. Overall, students did not cite the technological features of their courses as primary enhancers of satisfaction; rather, they viewed these features as occasionally problematic but ultimately desirable secondary mechanisms for ensuring convenience and interaction.

B. Next Steps
These early evaluations efforts will be succeeded by further evaluation activities including:

1. Expanded assessment and analysis focusing on factors that potentially influence performance and/or satisfaction (age, gender, ethnicity, educational background, occupation, location).
2. Program-level evaluation that assesses the effectiveness of curricular groupings of courses, activities, and services, particularly in terms of their ability to provide and sustain a viable learning community.
3. Implementation of “lessons learned” through assessment to improve recruitment, programming, and support products and processes.

VI. SUMMARY
Student feedback gathered through the formal evaluation process has already been used to improve World Campus recruitment, programming, and support services. For example, input relating to institutional and program motivators is guiding changes in marketing/recruitment materials to more strongly emphasize the high quality and competitive advantage students themselves emphasize as benefits of a World Campus education, as well as to clearly distinguish between easy access and easy content. Similarly, feedback about the convenience of course formats or the amount or “chunking” of course content is focusing attention on potential areas of improvement in course design, and has already spurred changes in the pacing of course activities. Finally, student comments and ratings of the importance of specific support services or options have reinforced the overwhelming importance to distant students of a strong learner support function. As a result, a major focus of both assessment and continuous improvement within the World Campus will be on the flexible, robust, and scaleable support options necessary to meet the needs of learners in the ALN environment.

However, it is important to realize that student perceptions of satisfaction are only one factor in the development of educationally sound, socially responsible, and fiscally viable programs. As the World Campus matures and expands, identifying, implementing, and assessing the proper balance of elements necessary to satisfy the sometimes complementary, sometimes conflicting needs of multiple stakeholder groups—students, faculty, institution, and society—will be an important and continuing challenge.

VII. ACKNOWLEDGMENTS
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THE COSTS AND COSTING OF NETWORKED LEARNING

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ABSTRACT
The development of networked learning and the increasing development of online courses by both traditional and distance education institutions has raised many questions concerning the costs of online learning relative to both face-to-face teaching and other approaches to distance education. Additionally, attention has turned to the problem of costing networked learning, though as yet little progress has been made. This paper discusses both the emerging evidence on the costs of networked learning, relative to other forms of education, and its costing.

KEY WORDS
Networked Learning, Online Education, Distance Education, Economics, Costs, Costing

I. INTRODUCTION

Until the late 1950s there was relatively little interest in the costs of education, and virtually none in the costs of educational technology. This failure reflected the fact that innovation in teaching methods was a largely marginal activity: as one early analyst put it, ‘education's technology, by and large, has made surprisingly little progress beyond the handicraft stage’ [1 (p.7)]. However, the rising demand for and escalating costs of education led to attempts within the newly developing sub-discipline of the economics of education to quantify both the efficiency of public expenditure on education, and the economic benefits of providing it [2, 3]. Educational technology came to be seen as a way of improving the efficiency of education through productivity increases. As a result analysts began to research into the costing of educational technology and the actual costs of distance education systems (for a fuller account of this work, see [4]).

Much of the early work undertaken under the auspices of the World Bank, UNESCO and USAID focused on the costs and cost structures of educational broadcasting projects [5, 6, 7, 8]. Within the UK other experts focused on the costs of using educational technology either for distance teaching or as a substitute for classroom teaching on campus [9, 10, 11, 12]. Some of this work was developed further in Australia within the context of universities mixing traditional and distance education approaches [13, 14].

The development of networked learning has once again raised similar questions as policy makers and analysts ask both whether networked learning is cheaper or more expensive than other approaches to education, and what needs to be taken into account in costing such systems.

II. FRAMEWORKS FOR COSTING

The key to much of the early work lies in the attempt to identify clearly the nature of the costs involved,
and what drives them, so that not only can all the relevant costs be taken into account, but also their behavior within planned or actual systems can be modelled.

So far as the nature of the costs are concerned, most studies adopt the conventional distinction between capital costs (buildings, equipment and furniture) which are annualized over their expected life, and revenue costs. The latter are normally categorized as staffing costs (including on-costs) and non-staffing costs (covering revenue expenditures on premises, stocks, supplies, consumables, and expenses). Generally capital costs have been regarded as non-recurrent costs—though the short life of some capital items, particularly in the IT area, means that institutions are increasingly treating such budgets as a recurrent item that is treated in much the same way as revenue budgets are. On the other hand, revenue expenditure on the development of course materials (which involves considerable expenditure on labor) in fact behaves very much like capital expenditure, incurred when the course is designed but expected to retain some value over the expected life of the course. While annualisation of traditional capital costs is commonplace, the annualisation of course development costs is less so. The failure to annualise course development costs is problematic given that the length of life over which courses last is a major factor in the overall efficiency of technology-based education.

At the macro-level the costs of any system are driven by a combination of the following factors, all of which are susceptible to management control:

- Course populations
- The number of courses offered
- The lengths of course lifetimes
- The media and technologies chosen
- The extent to which cost-inducing actions, for example, the use of copyrighted materials, are avoided
- The extent to which costs are placed on students, either as tuition, or by moving the system boundaries so that activities the institution might once have paid for are now paid for by students (e.g. access to tutorial and library services)
- The extent to which the institution employs people on contracts for service (i.e. salaried posts) to develop courses and teach students, rather than on contracts of service (i.e. hired as casual labor, to be paid by the manuscript/script/tutorial hour/test marked, etc.)
- The extent to which the institution adopts working practices that reduce the costs of labor by, for example, designing courses to be wrapped-around existing textbooks rather than developing new materials, and using author-editor models of course design, rather than big course team models
- The use of technology to increase the student load per academic or administrator
- Increases in the teaching load of academic staff at the expense of other functions – for example, research and public service, and …
- ‘Labor for labor’ substitution—the replacement of expensive academic labor by student and adjunct labor, in order to reduce staff costs.

An important element in costing is to understand the system being costed so that cost elements are not missed. Far too many analysts restrict their analysis to their own budget. Of course, understanding one’s own budget and controlling it is important. The answers one obtains to questions such as ‘How much will this cost me?’ and ‘Will doing it this way cost more or less than doing it that way?’ will help one decide whether, from a purely parochial interest, one should or should not proceed with a given course of action. However, the wider one’s span of interest, the more one will want to look at the macro-picture. Individual
teachers may be content to find out whether teaching online, for example, takes them more or less time than teaching face-to-face, but departmental heads will want to know whether they can teach more courses and/or more students per course, and what the effect will be on their expenditure and their income. Institutional heads will be concerned with all the above questions, but will also want to know what the impact is on administrative costs, while institutional heads and national educational planners may want to know whether teaching online is cheaper or more expensive than teaching face-to-face or by some other distance teaching methodology. Students will want to know whether taking a course online adds to their costs, or saves them money and/or time—and actually academics, course leaders, and institutional leaders should care deeply about student costs, since student decisions on whether or not to study with a particular institution will be driven in part by cost considerations. These considerations will go beyond the cost of tuition to cover the costs of engaging with the course (‘Do I need a computer to study this course? What travel costs might I incur? How much will the materials I need cost me? Will I spend significant amounts of money online? What are the opportunity costs if I take this course?’ etc.). This argues for a whole systems approach to the costing of projects that moves beyond the immediate concerns of individual course and departmental budgets to take account of the cost implications of the system as a whole on overhead functions and the customer.

The use of learning materials has already resulted in a sharp temporal differentiation between the design and delivery phases of the activity of teaching, with the design and production of complex multi-media courses beginning many months before they are taught, thus separating these activities in time (and often across budget years). Once created, the materials can be packaged in various ways and used, often for a number of years, on a range of different courses. They can also be used by very large numbers of students. All this makes it less likely that a single member of faculty will control the whole teaching-learning process from materials design through to delivery. On large population courses the chances are that not only will most of the actual interaction and assessment of students have to be farmed out to auxiliary teachers, but much of the administration of the teaching-learning-assessment process will also be handed to professionals whose task it will be to seek economies of scale and process. Division of labor between those who design the materials, those who teach the courses, and those who administer and support student progress, follows. Indeed, the capital nature of the costs expended on course development, the division of labor that occurs in many systems, and the fact that materials once developed may be repackaged for use on a number of courses, argue for a clear distinction to be made between materials development and course delivery.

To date issues around the division of labor have been seen most clearly in distance education – most notably in large-scale ‘first generation’ correspondence systems, and in ‘second generation’ educational broadcasting and ‘third generation’ multi-media systems. This ‘Fordist’ tendency has been greatly criticized by those who see it as a reflection of the increasing degradation of academic work. It has been suggested that just as cottage-industry correspondence systems can be run by faculty who retain control over the whole teaching-learning process, so the development of online education allows faculty to teach at a distance without losing control of their course—and indeed this is true in some cases. However, a division of labor is likely to occur because in the long run any system that limits control of design and delivery to a single person limits both the range and sophistication of the materials that can be developed, and the number of students that can be supported, and is thus inherently cost-inefficient given the much greater economies of scale and process achievable in systems designed around the division of labor.

In addition, a range of more immediately personal issues arises for faculty involved in the development of materials. For example, will such an academic have to continue to teach traditional students in class at the same time as he or she develops the internet course? Will he/she be given time off to compensate them for the time spent developing the course, and if so who will help teach the traditional course? Will he/she be
given no immediate help in the development of the course, but then be allowed – as happens in the French system—to substitute resource-based learning for personal teaching in the delivery phase, thus freeing up time that can then be spent on other more personal objectives (such as research and public service)?

To these issues must be added issues around the actual teaching of online courses, including such issues as the evolution of new academic roles such as e-moderating [15], and the extent to which teaching online requires more or less time of academics.

So far we have focused on the use of the network for academic purposes – in essence as the location through which ethereal (i.e. non-physical) course materials can be accessed, and as the site through which electronic dialogue and discourse takes place. But a fully developed e-education system would use the network and website as the location for the administration of the learners’ progress through the institution—that is, as the site through which students would electronically enroll, pay for their courses, change their records, and seek general counseling and advice. The development and maintenance of a web site to support academic and administrative functions must therefore be seen as an integral part of the provision of an e-education system, and hence of part of the costs of the system.

Those working within the teaching institution will of course be able to access the web site easily through the institution’s own network—but remote tutors and students also need access to the web site. This generally means providing their own computing equipment and connections to the web—though occasionally an institution may help by setting up tele-learning centers where students (and tutors) can make use of institutional equipment to access the site. Either way, the costs of access/reception are an integral part of the system as a whole, and need to be taken into account, if not for budgeting purposes, then at least for purposes of cost analysis.

On top of these elements are the costs of managing an e-education system. In virtual education institutions these overhead costs will be obvious, but in dual mode systems there is the possibility that these costs can be set aside, at least for a while, in order to give the e-education system a ‘free’ ride. Such free rides will not survive expansion, nor can they be ignored in cases where comparative costings between online and other systems are being attempted.

Thus the institutional costs of a fully developed e-education systems would include:

1. Developing e-materials
2. Teaching (and assessing) students online
3. Accessing the web site
4. Administering students online
5. Providing the infrastructure and support within which e-education can operate
6. Planning and managing e-education at the macro-level.

However, one is likely to find that the range of costs is very great. This arises in part because there are very different ideas as to what online learning actually is—varying from those who see it in terms of access to materials and to assessment schemes that favor multiple choice formats, to those who stress the communicative and constructivist nature of the dialogue that can occur between teacher and students, and among students. These different expectations of online learning are reflected in the costs of systems, making it hard to come to any concrete conclusions about their costs.
III. COSTING ONLINE LEARNING

In the light of the development of networked learning, a new generation of academics, interested in the impact of online learning on the costs of education, has begun to evolve a methodology by which to approach the task of costing such systems [16, 17, 18, 19, 20]. None of these studies provides a wholly comprehensive approach to the costs of networked learning. Such an approach would require an analysis that looked at the costs of a system:

(a) by expenditure category (using the traditional distinctions between human resource or staff costs, premises and accommodation costs, equipment and furniture costs, and the costs of stocks, supplies, consumables and expenses), and

(b) by contributor (e.g. the institution’s own budget, partner institutions’ inputs, direct government inputs, aid agency inputs, staff inputs, and student inputs), while

(c) distinguishing between capital and revenue costs, with the former, including the investment in course materials, annualized over their expected life, and

(d) where this seems sensible to the analyst, using an appropriate systems framework for the analysis of costs.

If this provides a framework for the analysis of the costs of online learning, the next issue must be, exactly what kinds of costs are being identified, and how should they be treated? The first thing to say is that all the relevant costs should be identified. Secondly, costs should not be netted off from income since this hides the full costs involved. In fact, examination of the work done to date shows that the different analysts:

- Lack agreement on the costs that should be taken into account. This is particularly the case with regards to overhead costs (i.e. the costs analyzed here within the regulatory and logistics sub-systems) that are, in general, ignored.

- Employ very different labels or terms to describe what they are costing. This reflects jurisdictional and linguistic differences in terminology, local institutional practice, and personal preferences.

- Aggregate or disaggregate costs in different ways.

- Employ a variety of frameworks to give coherence to their work.

Appendices 1–3 look at the costs of online learning, using a functional approach as the primary thrust of the analysis to distinguish between the costs of online materials development (Appendix 1), e-education delivery costs including teaching, assessment, and web access (Appendix 2), and overhead costs (Appendix 3). Within each of the tables that make up these appendices, column 1 of the table provides a brief description of the kind of expenditure involved, and this is then categorized (column 2) by expenditure type, viz. human resource (staff), buildings and accommodation, equipment and furniture, stocks, supplies, consumables and expenses. Finally, in column 3, there is a series of notes on the treatment of these costs.

While I have tried to be inclusive in my approach, I am conscious that there may be areas of cost that have not been identified either in sufficient detail, or at all. The items of expenditure identified should be regarded as illustrative rather than definitive. Analysts can, of course, adopt a different schema if they feel that this will be helpful.

However, the attempt to be inclusive does raise important issues about the scope of any costing project—that is, just how wide a range of costs should be included? Within an institution, this revolves largely
around issues to do with the treatment of overhead costs, but there are wider ramifications—notably, the contributions made by other stakeholders including students and staff (particularly pertinent if time and expenses are not fully reimbursed). Any study that seeks to compare the costs of one system with another (say, the costs of networked learning with traditional teaching, whether within a single institution or across institutions) should take a full-cost approach. Where this is not done, the comparison risks being misleading.

IV. THE COSTS OF ONLINE LEARNING

What do we know about the costs of networked learning? The major costs of e-education can be usefully considered under the three heads identified above—viz. the costs of developing web-based materials, the costs of e-education delivery, and the overhead costs of embarking on e-education. I shall take these in order.

A. Costs of Developing Online Learning Materials

Most of the technologies involved in Web-based courses have been around for a long time. They include the preparation of text, audio, video, computer-based tutoring, intelligent tutoring, exploratory learning, simulations, etc. What is distinctive is that these materials are now being put on a web site that can then be accessed by students. For many years distance educators have known that not only do media and technologies have their own cost structures, but also that some media are more expensive than others. Bates’s analysis of the costs of various media concluded that print, audio-cassettes, and pre-recorded Instructional Television are the only media that are relatively low cost for courses with populations of from under 250 students a year to over 1000 student a year. In addition, radio is also likely to be low cost on courses with populations of 1000 or more students [21 (p. 5)]. Hülsmann, on the basis of his study of the costs of 11 courses offered by 9 different European distance teaching organizations, argues that at £350 per student learning hour print is the cheapest medium to develop. Putting text up on the internet costs at least twice that, and possibly more. After that costs escalate through audio (£1,700), CD-ROM (£13,000), video (£35,000) and TV (£121,000) [22 (p. 17)].

These figures are based on averages across eleven courses in nine institutions, and hence need to be treated with care, given the wide variations in costs encountered in practice. However, the broad differences in media costs are carried through into the development of internet-based courses. Arizona Learning Systems found a wide variation in the costs of developing a course, of from US$6000 to $1,000,000 for a three unit internet course, depending on the approach used. Much of this is the cost of academic and technical labor. The cheapest approach involved the presentation of simple course outlines and assignments; the most expensive, at $1,000,000, involved virtual reality [23 (pp. 13–14)] (see Table 1).

<table>
<thead>
<tr>
<th>Table 1: Cost of developing a three-unit internet course (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Arizona Learning Systems, 1998)</td>
</tr>
<tr>
<td>Course outlines and assignments</td>
</tr>
<tr>
<td>Text</td>
</tr>
<tr>
<td>Text with reference material</td>
</tr>
<tr>
<td>Text with reference material and images</td>
</tr>
<tr>
<td>Audio and video</td>
</tr>
<tr>
<td>Simulations</td>
</tr>
<tr>
<td>Virtual Reality</td>
</tr>
</tbody>
</table>
The high costs of developing internet courses are confirmed by Saba, who suggests that commercial software companies developing courses for online instruction or publishers are spending at least $500,000 to fully develop a multimedia course [24].

There is some evidence that the lower levels of cost are more likely to be found on synchronous online courses, with asynchronous courses costing more. Certainly Whalen and Wright found significant differences between synchronous and asynchronous course development costs. The former required much less development time because they involved fewer media [25 (p. 32)].

A high proportion of the costs of developing materials is labor costs. All the research shows that it takes more academic time to develop media that will occupy a student for one hour, than it takes to develop a one hour lecture—although how much more time is difficult to quantify. Sparkes reckoned that it took from 2 to 10 hours to prepare a lecture, from 1 to 10 hours to prepare a small group session, and from 3 to 10 hours to prepare a video-tape lecture; however, it took at least 50 to 100 academic hours to prepare a teaching text, 100 hours to prepare a television broadcast, 200 hours to develop computer-aided learning, and 300 hours to develop interactive materials—to which in all cases one needed to add the time of technical support staff [26 (p.219)]. Boettcher suggests that it takes an average of about 18 hours faculty time to create an hour of instruction online [27]. Academic development costs can be reduced or at least kept in check by adopting cheaper approaches to course development—for example, author-editor models based on an editor working with consultant authors, instead of hiring permanent staff.

One of the problems with many of the studies now available is that they report the broad results, not the detail. It is therefore difficult to know what has been included and what excluded, and so whether the costings undertaken are comprehensive. Experience suggests, however, that all figures need to be treated with care. What does seem clear is that the costs of developing a course are being pushed up—and significantly so whenever media are used in a sophisticated way. If so, and if cost efficiency is an important consideration, then savings may need to be looked for in delivery.

B. The Costs of e-Delivery

Although the development costs of even relatively simple online materials may be higher than paper-based print, it seems fairly clear that there are considerable institutional savings on delivery costs. The Library of Virginia has digitized the state’s colonial records. This has drastically reduced the costs of fulfilling requests from readers. The costs to the library of providing a single copy of a four page report in digital format is just 90 US cents, compared with $19 to supply a surface-mail customer, and $12 to supply an on-site user [28]. Applied to course materials, online delivery to order could cut inventory, packing, and postage costs enormously. Online library services like those offered or under development by XanEdu and Questia are likely to be invaluable—provided the subscription rates that users are to be charged are not unreasonably high. However, students used to their course materials dropping through their letterboxes are likely to see their study costs rise as they access and perhaps pay for materials online, and print them off themselves.

What about the costs of computer-mediated communications and assessment? Here we get into the costs of labor and the problems of student load. Bates has suggested that in comparison with face-to-face teaching, CMC will lower the costs of tuition because a good deal of the students’ time is spent studying the material, and so the teacher needs to spend less time per student overall in class [28 (pp. 126–7)]. Other analysts argue that students will also spend a great deal more time learning from their peers, and that this too will reduce the demands they make of their tutors. Certainly DiBiase, teaching for Penn State
University’s World Campus, found that he and his Teaching Assistant were spending less time supporting students on an online course (1.6 hours per student against 2.6 hours on a regular course) [30 (pp. 15–16).

However, the general consensus seems to be that online tutoring adds to traditional faculty workload [23 (p. 20); 30] given the enormous volume of messaging [32] arising from increased interaction with students [33 (p. 37)], with each message requiring more time to compose than is the case in verbal interactions [34 (p. 223)]. For faculty, teaching online opens up the possibility that they are always in session—which translates into ‘taking more time’ [35]. Moonen thinks that the increased load would be of the order of 5 to 10 hours a week for a class of 60 to 120 students [32]. Jewett thinks tutors could well spend twice as much time tutoring online as they do face-to-face [33 (p. 41)]. This raises the question of how many students an online instructor can handle. In classroom courses in the USA it looks as if people think they can handle from 25 to 30 students, working perhaps 10 to 12 hours a week. Boettcher suggests that experience indicates that a member of faculty can handle more students on a web course—in the range 25 to 65, but that this will require more time—so that although there are courses with 50–60 students on them, there are many courses where student numbers are deliberately kept down, somewhere in the range of from 12 to 20 students [36].

One way of coping with an academic’s increased workload is to hire more staff but this, of course, costs more. However, the impact on labor costs can be reduced through ‘labor-for-labor’ substitution—that is, the substitution of cheap labor for expensive faculty labor. This cheap labor might be students [31], teaching assistants, or clerks covering help desks [23 (p. 24)]. These options are much discussed in the US literature. However, hiring cheaper labor is not possible in small classes run by just one academic; it only works in large classes [31]. Also, labor-for-labor substitution has its critics. Traditionally PhD students have helped teach courses but student labor is not the cheapest labor on offer. Adjunct staff hired by the class is even less expensive—so much so that there is concern that their employment could damage graduate programs by reducing the employment opportunities for PhD students [37].

Up to now I have been talking about the impact of CMC on the costs of traditional institutions. What about its impact on the costs of distance education delivery? Firstly, there is evidence that distance tutors spend more time moderating and tutoring e-courses. Tolley, drawing on her experience as a UK Open University tutor, found that she spent more than twice as many hours tutoring the online version of What is Europe? as she did the ‘traditional’ version—120 hours against 48 [38 (p. 263)]. She was not paid for the additional work, which also had a dramatic effect on her phone bill. Annand, from his perspective at Athabasca University, suggests that it is these costs that may in the end constrain the extent to which large-scale distance teaching universities can adopt online technologies [39 (p. 20)]. Some institutions are trying to find ways of containing demands on tutor time by controlling student expectations and limiting the time for engagement on a particular topic; others, like the e-University, might subcontract tutoring to commercial ventures like Tutor.com, which will charge students for the service [40 (paragraphs 79–80)].

Secondly, there are the costs of reception. Cost analysis tends to be bounded by the institutional budget. The costs students incur in acquiring and operating equipment is not generally taken into account—yet from the would-be student’s point of view, these costs can have a major impact on affordability, and hence on access. In the USA the distribution of computers is highly graduated by income, race/ethnicity, and educational attainment [41]. In the Third World, the situation is much worse. If owning the equipment is a necessary condition for participation, then expect to see more disadvantaged people being excluded on cost grounds.

Local centers may, of course, mitigate student costs by providing access to machines, but they cost a fair
amount in rent, equipment, furniture and staffing to set up—and generally accommodate very few
students at any one time. This is not a solution to mass access—which is why the African Virtual
University is such a limited project. Internet cafés cost money to use and are not necessarily ideal
environments for study. In any case, in a country like Uganda, anything that uses a telephone line is
extremely expensive.

The assumption behind many of the cases put forward to support the development of e-teaching is that the
technology will substitute for the labor costs of teaching. Students will, it is assumed, spend a lot more of
their time studying independently from the materials, and much less time in formal classes. One potential
advantage is that this will make more faculty time available for students to discuss with their teachers
what they have learnt independently [42]—but if so, any savings in faculty time disappear and are likely
to be at most modest [43]. If there are no savings on faculty time, then the argument begins to focus on
balancing the additional technology costs against sometimes more tenuous accommodation savings—
which is not to say that some projects such as the Florida Gulf Coast University do not hope to make
substantial savings on building costs [43]. In any case, as Massy and Zemsky [42] comment, actually
achieving capital for labor substitutions may prove difficult for many colleges.

One other factor is the extent to which faculty are properly reimbursed for the costs they incur when
teaching online. Schifter [35] reports the very wide range of practice that occurs. Her analysis suggests
that many distance teachers do not have their costs reimbursed.

Generally speaking, there are powerful incentives to bring the costs of teaching down. In a situation
where the technology, far from reducing contact hours, may be actually increasing faculty hours spent in
contact with students, there are powerful pressures to reduce faculty labor costs by substituting cheaper
for more expensive labor. This does not always replace experienced by inexperienced staff; some systems
go out of their way to hire recently retired faculty who are looking to supplement their incomes.
Nevertheless, the fact remains that the pressure is on to reduce costs. Mass education distance teaching
universities such as Britain’s Open University, with some courses having over 10,000 students enrolled at
the same time, have had to employ models based on a division of labor between those who develop the
course materials, those who teach/tutor, and those who mark examination scripts. Not surprisingly the
Open University employs its tutors and script markers on contracts of service. Institutions that restrict the
number of students taking distance courses do not have the same problem. Certainly with the exception of
a few institutions such as the non-traditional University of Phoenix, practice in America has generally not
led to any systematic restructuring of academic labor force [44]. Nevertheless, a general increase in the
use of adjunct and part-time faculty has been noted [45], while the pressures to massify and reduce costs
must give managers an incentive to hire casual labor.

Another factor at play here is the extent to which costs that used to be met by the teaching institution—or
at least were wrapped up in the tuition fees charged—are now being pushed on to students quite overtly.

C. The Costs of e-Administration

We know very little about the costs of e-administration, but on the whole this may be the area where
savings are most likely to occur. Service costs in a range of industries are being brought down as
institutions invert traditional processes, such as student services, to focus more on Web-based, self-
service models [46 (p. 17)]. A paper-based order costs about $65 to fulfill—but it only costs around $5 to
fulfill an online order [47 (p. 23)]. A paper-based invoice may cost US$0.90 to produce and distribute;
online services can reduce this to something like $0.40–$0.60 [48], and speed the whole process up.
Perhaps 75% to 90% of transactions currently done manually and on paper should be done electronically [46 (p. 17)]. This trend will impact on all educational institutions.

E-commerce practices are also invading education to provide income streams. Many US campuses are now allowing advertising on their web sites—with the income from advertising offsetting the cost of the site [46 (p. 15)]. Some universities—such as Georgetown University—have auctioned spare course capacity on the Internet, with bidders hoping, of course, to get a place on an expensive course at a discount [46 (p. 15)]. We can expect eduCommerce to proliferate [46 (p. 15)]. Certainly the e-University Business Model assumes that this kind of activity will occur [40 (paragraphs 194–5)].

Nevertheless, entering the e-commerce market has its costs. A Gartner Group report suggests that e-commerce web sites are harder than expected to build, with costs of US$1 million on average—and that this cost is likely to increase by 25% per annum over the next 2 years. Of this cost, 79% is labor-related, 11% hardware, and 10% software [49]. Few cost studies of online learning appear to cost the development of the web site at anything like this level of expenditure. This must be a cost in the development of a virtual university. In mixed mode institutions, only part of these costs would now generally relate to the development of an online learning capability. However, the costs of a web site supporting a sophisticated online administrative function are likely to be high.

In general, none of the studies undertaken to date adequately factor in the costs of overheads. Although, the costs of putting in equipment directly associated with the projects (e.g., servers) are usually taken into account, as are the costs of software licenses, college operating budgets do not usually reflect the full costs of maintaining networked services [50]. This is something that the US COSTS project is tackling [50, 51]. The annualisation of equipment also causes problems. Most of the cost studies annualise equipment over five years [17, 23], but in the US in 1998/99 the typical replacement cycle for computers was 3 to 5 years; for central servers 3 to 4 years; and for network electronics, 5 to 6 years [51]. This may seem insignificant—but it impacts on costs significantly, and even more so when the opportunity cost of capital is taken into account. Replacement costs, which tend to rise, are often under-estimated: Ritschard and Spencer [52] argue that the theoretical replacement cost is the average cost per machine times the number of machines to be replaced. They suggest that annual provision for replacement of computers needs to run at 61% of the theoretical replacement cost. Provision for upgrades of equipment that will not be replaced like-for-like requires an additional 8% of the theoretical budget. Another 6% needs to be set aside for unplanned replacements and unforeseen contingencies; a further 20% budgeted for new staff positions; and another 5% for ‘out-of-cycle’ changes and upgrades.

Finally, higher-level management costs, including planning and evaluation, are rarely taken into account. Overhead management time is often hard to identify. Much depends on the context—the time spent agreeing that a group of enthusiasts can develop a project will be very different to that required to change an institution’s direction. Indeed, developing an IT strategy is likely to be expensive [29, 53].

These omissions are not always obvious from the cost studies. As this section of the paper makes clear, there are both significant costs involved, and the potential for significant savings in administration. The fact that overhead costs and savings are not built into comparative studies of the costs of online, traditional, and other forms of distance education, must mean that any conclusions drawn from such comparative studies have to be treated with care.
V. COMPARING THE COSTS OF E-EDUCATION WITH OTHER FORMS OF EDUCATION

Having looked at the costs involved in online education, let us look at how the costs of e-education courses compare firstly with those of class-based education, and secondly with other forms of distance education.

A. Comparing e-Education Costs with the Costs of Face-to-Face Education

Whether one system is more or less expensive than another will depend upon a range of factors such as those I discussed earlier. One approach is to substitute CMC for face-to-face tuition—leaving everything else unchanged. A study conducted at the University of Illinois found that unit costs came down on all nine courses in which asynchronous learning networks were substituted for face-to-face instruction [31]. Bates also thinks that online university courses using just CMC, and involving no real e-materials development, will be cheaper than face-to-face courses [29 (pp. 126–7)]. However, most online courses involve some materials, so that cost-efficiency depends on the number of students enrolled. Bates suggests that a standard Web-based course, with a mix of pre-prepared Web materials, online discussion forums, and print in the form of required texts, is increasingly more cost-effective than face-to-face teaching as numbers per class increase beyond 40 per year over a four-year period. Under 20 students, it is not economically worth doing. Between 20 and 40 students per year per course, any cost differences are likely to be less significant than differences in benefits [29 (pp. 128–9)].

If we widen the argument to take into account training costs that fall on employers, then we find that there are stronger reasons to believe in savings. There is general agreement that online training courses are less expensive than face-to-face ones provided the development costs are spread across sufficient numbers of students (possibly over several years), and provided that one takes into account both savings on travel and accommodation costs, and the fact that less of an employee’s productive time is lost (employees now train in their own time rather than in the firm’s time) [54 (pp. 142–3); 55 (pp. 12–14); 17 (p. 40)].

However, things do not look so good once purpose-built materials are added in: Bates says that if as well as having CMC, one also develops purpose-built materials, then the unit costs will be more expensive than face-to-face tuition [29 (p.128)]. Arizona Learning Systems found that the cost per course enrolment of an ‘average’ Internet course (US$571) is higher than that of traditional classroom instruction (US$474), though labor-for-labor substitution might bring this down to $447 [23 (p. 24)]. However, much depends on the nature of the materials and their associated development costs which, as we saw, they estimated to vary from US$6000 to $1,000,000 for a three unit Internet course [23 (pp. 13–14)].

B. Comparing e-Education Costs with the Costs of Other Distance Educations

What about the cost comparison with other forms of distance education? We have very few studies go on. In an Australian study, Inglis found the online version of a course was less cost efficient at all levels of enrolment than a print-based distance education course [34 (p. 233)] (Table 2).
Table 2: Average Cost per Student of Print and Online Versions of a Course
Source: Inglis (1999: 231)

<table>
<thead>
<tr>
<th>Volume of students</th>
<th>Print version</th>
<th>Online</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>169.84</td>
<td>217.71</td>
</tr>
<tr>
<td>100</td>
<td>125.38</td>
<td>171.63</td>
</tr>
<tr>
<td>150</td>
<td>110.56</td>
<td>156.27</td>
</tr>
<tr>
<td>200</td>
<td>103.15</td>
<td>148.59</td>
</tr>
</tbody>
</table>

Elsewhere, Jung compared the costs of presenting standard three credit courses at the Korea National Open University. The course involving textbooks, CD-ROM and electronic tuition was more expensive than the courses using textbooks, radio and face-to-face tuition, or those using textbooks, television and face-to-face tuition. However, dropout was only 10% on the e-course, compared with 60% on the other two types [56 (pp. 228-9)] (Table 3).

Table 3: Costs of Distance Education at the Korea National Open University
Source: Jung (2000: 229)

<table>
<thead>
<tr>
<th>Rating</th>
<th>TV-based course</th>
<th>Radio-based course</th>
<th>Web-based course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media</td>
<td>16 week, 3 credit</td>
<td>16 week, 3 credit</td>
<td>16 week, 3 credit</td>
</tr>
<tr>
<td>Media</td>
<td>Textbook, TV programmes and face-to-face tuition</td>
<td>Textbook, radio programmes and face-to-face tuition</td>
<td>Textbook, video- and audio-clips, electronic tuition</td>
</tr>
<tr>
<td>Number of students</td>
<td>1000</td>
<td>1000</td>
<td>30</td>
</tr>
<tr>
<td>Cost to produce and deliver US$</td>
<td>80000</td>
<td>35000</td>
<td>13000</td>
</tr>
<tr>
<td>Cost per student US$</td>
<td>80</td>
<td>35</td>
<td>434</td>
</tr>
<tr>
<td>Dropout rate (%)</td>
<td>60</td>
<td>60</td>
<td>10</td>
</tr>
<tr>
<td>Cost per completed student US$</td>
<td>200</td>
<td>87.5</td>
<td>482</td>
</tr>
</tbody>
</table>

Overall, then, these studies suggest that e-education is pushing the costs of distance education up. Some of these additional costs are being passed onto the students, but not all of them. And while no doubt the costs of the technology will come down, the fact remains that those who are not able to afford e-education are being written out of the game. This is true within developed countries, at least in respect of some sectors of the population, but much more widely the case in developing countries [57 (p. 150)].

VI. WHAT OUTPUT IS BEING COSTED?

The output measures used in cost studies vary from study to study. Some studies are based on the cost per student and/or the cost per graduate, but while this may be a suitable measure of output on which to make cost comparisons between educational systems and institutions, for most purposes a better measure is the cost per student per course. Courses are not, however, standard entities—and hence many studies seek to qualify this measure by defining the kind of course that is being costed in terms of a ‘standard’ course.
measured in credit points or credit hours. Unfortunately this also has its problems because internationally
the credit weighting of a course may relate to different things:

(a) the total expected number of hours that the average student will spend studying the course.
   This measure applies in the UK, for example, where there is an assumption that a standard
   three year Bachelor’s degree will require 120 credit points of study per year, with each credit
   point being equivalent to something like 10 hours study.

(b) the total timetabled weekly contact hours—which is the system found in the USA—and
   which of course does not reflect the actual hours study put in by students.

Distance education courses by definition do away with or at least sharply reduce the amount of contact
between teachers and students, replacing this with independent study. The latter may be based upon
reading, listening to, watching, or otherwise engaging with learning materials; doing assignments and
tests; or general reflection. This means that the actual time spent studying the materials may have little
relation with the total study time theoretically assigned to the course. For example, Hülsmann [22 (p. 42)]
found that the faculty who developed a British Open University course on mathematical modeling
estimated that the course would require some 448 hours study over the year—but that the actual time
spent studying the various mediated elements of the course (text, CD-ROM, video) was estimated to be
336 hours—so that the course study hours were 1.5 times the media study hours. On the other hand, a
course for teachers and social workers offered by NKS Norway required 700 hours study, but only 106
hours of this study arose from the studying the print and video materials provided. Here course hours
were 6.8 times the media study hours. These differences leads Hülsmann to suggest that the most
appropriate approach to costing media is separately to divide the cost of developing and delivering a
given medium by the number of student study hours the medium gives rise to. Thus, for example, a 50
page text that cost £17,500 to develop and that takes an estimated (and average) 5 hours to study has a
development cost per student study hour of £350, while a one-hour audiotape that cost £1700 to develop,
and takes one hour to study, has a cost per student study hour of £1700 [22 (p. 17)]. Although there is an
element of subjectivity in estimating how long an (average) student will spend studying a particular
element of course material, this does give an easy guide to the relative costs of different media. In
practice, however, there is a range of factors that impinge on the costs of developing and delivering media—
not least questions related to the quality of the materials and the organizational structure and labor
market conditions that underpin its development/delivery—and these differences are almost certainly
behind the range of costs per student study hour that Hülsmann found in practice across the 11 courses
that he studied [22 (p. 145)]. Having said that, the approach enabled him to show the rough order of costs
involved, and to establish beyond reasonable doubt that Internet-based text is more expensive than printed
text (by a factor of 2), with the cheaper media being print and audio. Certainly Hülsmann’s approach to
the measurement of outputs has a great deal to commend it.

VII. CONCLUSIONS

This paper has sought to do two things: firstly, to review the current approaches to costing e-education
and to suggest how this might be best approached, having regard to the issues that have been identified,
and in the light of the methodological considerations identified, to look at some of the current range of
cost comparisons available. Hopefully it will stimulate others to undertake more cost studies—if only to
ensure that we know the costs of the direction upon which we now seem to be embarked.
VIII. REFERENCES

13. **Rumble, G.** Activity costing in mixed-mode institutions: a report based on a study of Deakin University, Geelong, Victoria, Deakin University, Distance Education Unit, 1986.


34. Inglis, A. Is online delivery less costly than print and is it meaningful to ask? Distance Education 20(2): 220–39, 1999.


55. Inglis, A. Is online delivery less costly than print and is it meaningful to ask? Distance Education 20 (2): 220–39, 1999.
### IX. APPENDICES

#### Appendix 1: Developing e-Materials

<table>
<thead>
<tr>
<th>Expenditure Descriptor</th>
<th>Expenditure Category</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials</td>
<td>General Comment</td>
<td>Internet courses may involve a range of media ranging from a brief course outline linked to existing textbooks; texts (content) online; texts + reference materials; images; audio; video; simulations; and virtual reality [23, also 22]. Media choice has a considerable impact on development and production costs. Materials are usually developed to last several years, so there is an argument for annualising their costs over the life of the course. Most materials relate to the subject being studied. However, some are of a more administrative nature – information on rules and regulations relating to the course, information on examination arrangements, etc. Such materials properly constitute a cost of a particular given course. Yet other materials may be sent to all the students registered on a group of courses – in which case the cost of these materials would need to be apportioned across the courses (or course enrolments). Not all materials need be supplied direct by the institution. In some cases students will be asked to buy commercially available textbooks, videos, software, etc. These costs are properly a cost of the course – but incurred by the student. Any full-costs study would need to recognise such costs.</td>
</tr>
<tr>
<td>Staffing</td>
<td>Human Resources</td>
<td>The actual amount of time involved in developing courseware varies significantly depending on media [26]. How jobs are packaged varies considerably. Many large-scale distance teaching institutions divide the labor between those who develop materials, those who teach, and those who mark examinations. Development roles may also be distinct, with divisions between, for example instructional design, content development, content editing, graphic design, etc. Some systems use core staff on full-time salaries with benefits; others use consultants paid by</td>
</tr>
</tbody>
</table>

- instructional design
- content development
- text authoring
- software development
-multimedia design and production
-course specific software development
-content integration and testing
-post-test modification costs
-training
output.

In dual mode systems, the preparation of online materials may be regarded as an extra duty, attracting additional payments/compensation (overload pay). Or staff may be relieved of other duties (release time) This may well represent an additional cost to the employer if this time has to be replaced. On this see [35].

<table>
<thead>
<tr>
<th>Staff equipment</th>
<th>Equipment</th>
<th>Some systems may purchase computers and software to enable staff to develop courses; others expect staff (particularly consultants) to provide their own [35].</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff expenses arising during development of materials</td>
<td>Expenses</td>
<td>The extent to which development staff have their ISP costs met varies [35].</td>
</tr>
<tr>
<td>Copyright clearance</td>
<td>Expenses</td>
<td>Third party copyright can be a significant expense—so much so that some systems may decide not to use any third party material at all [58].</td>
</tr>
</tbody>
</table>

**Materials production**

<table>
<thead>
<tr>
<th>Production costs</th>
<th>Staff costs, Stocks, Supplies, Consumables</th>
<th>e.g. costs of producing a CD-ROM for delivery to each student on a course</th>
</tr>
</thead>
<tbody>
<tr>
<td>- text production</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- audio production</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- video production</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- graphics production</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- software production</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Materials—annual revision (maintenance function)</th>
<th>Staff costs</th>
<th>As for original production costs. The degree of remake may vary, but some revisions—for example, the development of new assignment and examination questions, may be a regular feature of course maintenance.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expenses</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Developmental testing of course</th>
<th>Staff costs</th>
<th>Payments to course testers; general running costs of developmental testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expenses</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Appendix 2: E-delivery Costs**

<table>
<thead>
<tr>
<th>Expenditure Descriptor</th>
<th>Expenditure Category</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials Delivery</td>
<td>Expense</td>
<td>Postage, courier, etc costs arising from the distribution of physical goods. Online delivery costs of ‘ethereal’ goods.</td>
</tr>
<tr>
<td>Distribution of courseware (e.g. CD-ROMs, user manual, electronic materials, etc) to students</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials reception expenses</td>
<td>Expense</td>
<td>This might include incidental costs of reception, costs of purchasing materials, etc.</td>
</tr>
<tr>
<td>Any expenses incurred by those receiving the materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student/tutor equipment</td>
<td>Equipment (capital)</td>
<td>Few institutions now provide students with computers and most analysts (e.g. [22]) assume that students will provide their own equipment (though tutors may be given help—see [35]).</td>
</tr>
<tr>
<td>Network/computers/printer</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

208
<table>
<thead>
<tr>
<th>Cost Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software (capital)</td>
<td>Institutionally this is a non-cost, but it remains a ‘full-system’ cost and should be taken into account for comparative costing purposes. Student and tutor equipment needs to be annualized (perhaps over 5 years, though this may be optimistic) [50]. Some systems require non-core staff to provide their own equipment (see assumptions built into [37]). The initial cost of common software is bundled in with machine purchase—but ‘specialist’ software may need to be purchased. This is a capital cost but it would be unwise to assume that the software will last as long as the computer. Students may well need to budget to upgrade software.</td>
</tr>
<tr>
<td>Student/tutor expenses</td>
<td>Includes any payments to an ISP and/or connection charges for time online; also needs to cover increased energy costs. Tutors may have their ISP costs refunded [35]. Insurance costs (for equipment) Equipment repair costs</td>
</tr>
<tr>
<td>Opportunity costs</td>
<td>Opportunity cost for all students, but staff cost for firms This is a real opportunity cost to employers, and also to the self-employed, who could be doing productive work rather than spending time in training. There is an argument in any cost comparison exercise for placing a value on every student’s time (c.f. [25]). It has been suggested that online courses compress the time required to undertake training.</td>
</tr>
<tr>
<td>Tuition</td>
<td>Staff Expenses Payment for teaching students online varies. In some systems permanent full-time staff may do the teaching; in other cases staff may be hired by the hour to teach online. Casual labor and labor substitution is commonplace. There is a debate as to whether online teaching takes more or less time (see article). In a dual mode system, teaching online may be regarded as part of normal duties; or it may be regarded as an additional (new) duty which releases staff from other teaching duties (release time) [35] or it may be regarded as an additional duty for which staff are paid overtime (overload pay) [35].</td>
</tr>
</tbody>
</table>
Institutions may restrict enrolments on online course in order to contain the impact of online teaching on staff time (which has implications for costing exercises looking at the impact on costs of expansion).

Student/Tutor Helpdesk Staffing

<table>
<thead>
<tr>
<th>Expenditure Descriptor</th>
<th>Expenditure Category</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>High level decision making to embark on online learning</td>
<td>Staff costs</td>
<td>Leach and Smallen [51] estimate that staffing the typical Helpdesk represents between 7–12% of the total central IT staff. Call centers may well have less expensive front-line staff to handle routine queries, together with a referral system to faculty where this is necessary.</td>
</tr>
</tbody>
</table>

Call costs

<table>
<thead>
<tr>
<th>Expenditure Descriptor</th>
<th>Expenditure Category</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Expenses</td>
<td>Some help desks provide students with toll free access.</td>
</tr>
</tbody>
</table>

Appendix 3: Overhead and Infrastructure Costs

<table>
<thead>
<tr>
<th>Expenditure Descriptor</th>
<th>Expenditure Category</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>High level decision making to embark on online learning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decision-making</td>
<td>Staff</td>
<td>Overhead management time—often difficult to identify. Much depends on the context and whether the activity is marginal or central to management concerns. Development of an IT strategy requires considerable time and effort [29, 53]</td>
</tr>
<tr>
<td>Expenses related to high level decision-making</td>
<td>Expenses/ consumables</td>
<td>e.g. costs of study tour to existing virtual universities; costs of consultants brought in to advise. These costs are difficult to trace where the decision is marginal to the ongoing concerns of an institution, but easier to trace if one is setting up a new institution or department.</td>
</tr>
<tr>
<td>Institutional evaluation/quality assurance Expenses</td>
<td>Staff cost Expenses/ consumables</td>
<td>E.g. survey costs, report production and dissemination costs, etc.</td>
</tr>
<tr>
<td>Web-site development costs</td>
<td>General comment</td>
<td>Likely to be expensive [49]</td>
</tr>
<tr>
<td>Overall web site costs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Web site development staffing costs (e.g.)</td>
<td>Staff cost</td>
<td>As suggested in [49], staff costs put into web site development can be significant</td>
</tr>
<tr>
<td>- Internet specialists</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Graphics/Internet designer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff computers purchase Software purchase</td>
<td>Capital</td>
<td>Annualise: most commentators use a 5-year life but this may be optimistic. Typical replacement cycles in US colleges are between 3 and 5 years [50]. Software may well have an even shorter life.</td>
</tr>
<tr>
<td>Staff computers repair</td>
<td>Expense</td>
<td></td>
</tr>
<tr>
<td>Web site implementation General comment</td>
<td>All cost categories</td>
<td>Generally the full costs of networked services are not as yet reflected in the annual operating budgets</td>
</tr>
<tr>
<td>Service</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>-------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Domain name registration</td>
<td>Expense</td>
<td></td>
</tr>
<tr>
<td>Learning Platform Software</td>
<td>Capital</td>
<td>Initial cost</td>
</tr>
<tr>
<td>License Fees, and Upgrade costs</td>
<td>Expense</td>
<td>Annual update at 10% [25]. Wide variation in the cost of licenses from Canadian $3000-175,000 [25].</td>
</tr>
<tr>
<td>Network server</td>
<td>Equipment</td>
<td>Annualise over lifetime. Many commentators suggest a 5-year life but the typical annualisation period to be between 3 and 5 years [51]. Actual system cost studies suggest wide variation in costs allowed for this.</td>
</tr>
<tr>
<td>Network costs – access to Internet</td>
<td>Expense</td>
<td></td>
</tr>
<tr>
<td>Buildings and accommodation (main offices etc.)</td>
<td>Capital or expense</td>
<td>Capital costs need to be annualized. The actual construction cost of a building may be known (but if in the past, should be brought up to present day values), or may be estimated (using the average building cost per square meter/foot for that type of building). The lifetime of buildings is debatable but probably ranges from 5–10 years (temporary buildings) to 50 (permanent buildings). Smaller projects utilizing a few rooms within an organization might be charged a proportion of the total building costs, based on floor space as a proportion of all space. Alternatively a shadow rental cost could be used, based on commercial rents payable in the area. Generally space costs are driven by the number of staff working from an office complex, together with space for consultants’ workstations; home-based workers will use their own space and in that sense not be part of the space calculation. However, any comparative study should put a cost on home office space.</td>
</tr>
<tr>
<td>Purchase of land</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction of a new building</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purchase of an existing building</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refurbishment cost of an existing building</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rental of office accommodation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buildings and accommodation: running costs including rates (i.e. tax levied on the occupation or ownership of land); buildings and contents insurance; utilities (heat, light, water, power, waste disposal); telephone, fax, etc (rental and usage); repairs and maintenance (direct labor plus materials, or outside contractor charges plus management and supervision)</td>
<td>Stocks, Supplies, Consumables and Expenses</td>
<td>These items are either treated as a general overhead expense, or they are charged to particular departments and treated as a departmental expense. Where they are treated as a general overhead expense, some proxy measure may be used to allocate these costs out to departments (e.g. floor space measures, staffing levels) In systems where online learning is only part of the activity some kind of measure will need to be used to allocate a proportion of the general expenses to</td>
</tr>
</tbody>
</table>
**The Costs and Costing of Networked Learning**

<table>
<thead>
<tr>
<th>Costs</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The online operation.</td>
</tr>
<tr>
<td></td>
<td>Grounds and gardens; porters; security; cleaning; management and supervision of all these activities</td>
</tr>
<tr>
<td><strong>Intranet cost (main offices)</strong></td>
<td>Start-up capital costs (new PCs, network connections for PCs not currently networked, servers and server software, and software applications whether developed in-house or purchased</td>
</tr>
<tr>
<td></td>
<td>An intranet may exist but if not capital equipment costs will be incurred establishing it. Capital costs will need to be annualized. Leach and Smallen [51] found the typical annualisation period to be 5 to 6 years. However, some of the equipment will be subject to annual upgrading, repair, etc. Software applications are likely to have a shorter life and require upgrading more regularly.</td>
</tr>
<tr>
<td></td>
<td>Start-up costs (e.g. design consultancy costs, costs of in-house designers and technical support staff, training costs)</td>
</tr>
<tr>
<td></td>
<td>Revenue expenses and staff costs</td>
</tr>
<tr>
<td></td>
<td>On-going revenue costs (e.g. editorial and design staff, technical personnel, etc., on-going consultancy, promotion, training, maintenance of bespoke applications)</td>
</tr>
<tr>
<td></td>
<td>Revenue staffing costs and expenses</td>
</tr>
<tr>
<td><strong>Furniture (main offices)</strong></td>
<td>Furniture</td>
</tr>
<tr>
<td></td>
<td>Capital</td>
</tr>
<tr>
<td></td>
<td>Distinguish between the cost of dedicated staff workstations (linked to staff numbers) and the costs of shared workstations/common furniture—spread across staff.</td>
</tr>
<tr>
<td><strong>Local center/training center</strong></td>
<td>Accommodation</td>
</tr>
<tr>
<td></td>
<td>Expense (conceivably a capital cost)</td>
</tr>
<tr>
<td></td>
<td>Systems that provide telelearning centers will incur accommodation costs—with the accommodation usually rented, though purchase is a possibility. There will also be the associated running and maintenance costs of each center in the system.</td>
</tr>
<tr>
<td><strong>Equipment and furnishing</strong></td>
<td>Equipment and furnishing</td>
</tr>
<tr>
<td></td>
<td>Capital cost (equipment and furniture)</td>
</tr>
<tr>
<td></td>
<td>A telecenter will need desks, chairs, storage cupboards, shelving (for a small library) as well as equipment (server, several PCs, printer(s), fax, photocopier, telephone, etc.)—together with the associated wiring.</td>
</tr>
<tr>
<td><strong>Staffing</strong></td>
<td>Staff cost</td>
</tr>
<tr>
<td></td>
<td>Technical and security staff</td>
</tr>
<tr>
<td><strong>Consumables and expenses</strong></td>
<td>Consumables and expenses</td>
</tr>
<tr>
<td><strong>Equipment replacement</strong></td>
<td>Capital (funded from revenue)</td>
</tr>
<tr>
<td></td>
<td>Simple depreciation does not allow sufficient money for replacement of equipment.</td>
</tr>
<tr>
<td><strong>Insurance of equipment</strong></td>
<td>Expense</td>
</tr>
<tr>
<td><strong>Digitized courseware / general library—development and running costs</strong></td>
<td>See [28] for a case study</td>
</tr>
</tbody>
</table>
The Costs and Costing of Networked Learning

<table>
<thead>
<tr>
<th>Item</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment—initial purchase and replacement</td>
<td>Capital</td>
<td>e.g. computer, scanner, software. Costs need to be annualized.</td>
</tr>
<tr>
<td>Maintenance of equipment</td>
<td>Expense</td>
<td></td>
</tr>
<tr>
<td>Technical staff to create and maintain record—document</td>
<td>Staff costs</td>
<td>Salary and on-costs (benefits)</td>
</tr>
<tr>
<td>scanning, indexation, etc., and to maintain system/equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marketing costs</td>
<td>Expenses/ consumables</td>
<td></td>
</tr>
<tr>
<td>Non-staff costs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shared central costs</td>
<td>All revenue cost types</td>
<td>In dual mode systems, a proportion of these overhead costs would need to be apportioned to the networked learning ‘enterprise’, and the rest to other business objectives.</td>
</tr>
</tbody>
</table>

**X. ABOUT THE AUTHOR**

**Greville Rumble** is Professor of Distance Education Management at The Open University in the United Kingdom, and Editor of the journal *Open Learning*. Originally a historian with a BA and research-based MA from the University of Kent at Canterbury, his PhD from The Open University was on the costs and economics of open and distance learning. He has published extensively on the planning, management and costs of distance education, and has worked professionally in over 40 countries.
I. INTRODUCTION

Many students who begin postsecondary education drop out before completing a degree. According to the Lumina Foundation, an estimated 60% of students at public institutions fail to complete degrees within five years, and half of these students leave during the freshman year. As shown by research by the Policy Center on the First Year of College at Brevard College (NC) and others, the first year of college is the most critical to a college student's success and to degree completion.

Successful completion of introductory courses is critical for first-year students, but typical failure rates in these courses contribute heavily to overall institutional drop-out rates between the first and second year. Although success rates vary by institutional type and by subject matter, Research I universities commonly cite a 15% drop-failure-withdrawal (DFW) rate in introductory courses. Comprehensive universities’ DFW rates range from 22% to 45% in these courses. Community colleges frequently experience DFW rates of 40% to 50% or more.

Most of the weaknesses attributed to large introductory courses are generic in nature and have as their source the limitations of the predominant form of instruction in U.S. colleges and universities: the didactic lecture. An overwhelming body of research shows that students do not learn effectively from lectures, and testimony from the field corroborates the literature.

What's wrong with the lecture? The lecture method treats all students as if they were the same, as if they bring to the course the same academic preparation, the same learning style, the same motivation to learn, the same interest in the subject, and the same ability to learn. The reality is that students with weak skills need more individual attention and more opportunity for interaction, particularly at the beginning of the term. At the same time, students with strong skills are locked into a fixed time frame for completing the course. The large, impersonal lecture format simply cannot accommodate the broad range of differences among students.

Most lecture courses are notoriously ineffective in engaging students. The lecture format neither encourages active participation nor offers students an opportunity to learn collaboratively from one another. It does not provide adequate tutoring assistance, and consequently, students receive little individual attention. Even though individual help may be available during office hours, only a small fraction of students take advantage of this help. Most students simply study the text, turn in their homework, and take quizzes and exams.

The primary alternative structure for large-enrollment courses, the multiple-section model, suffers from
problems of its own. In theory it allows greater interaction with students, but in practice, sections are often quite large and are dominated by the same presentation techniques as used in larger courses. In addition, the multiple-section model suffers from a lack of coordination. As a result, course outcomes vary considerably and, more important, are not always consistent with students' abilities.

Clearly, making significant improvements in first-year courses can have a major impact on student success and retention.

II. THE PROGRAM IN COURSE REDESIGN

Supported by an $8.8 million grant from the Pew Charitable Trusts, the Program in Course Redesign [1] was created in April 1999 to demonstrate how information technology could be used to address the significant academic problems experienced by first-year students at most institutions. The program is managed by the Center for Academic Transformation [2] at Rensselaer Polytechnic Institute. Selected from hundreds of applicants in a national competition, 30 institutions each received a grant of $200,000, awarded in three rounds of 10 per year. Participating institutions include research universities, comprehensive universities, independent colleges, and community colleges in all regions of the United States.

Comparative research studies have shown that, instead of improving quality, most technology-based courses produce learning outcomes that are only “as good as” their traditional counterparts—the “no significant difference” phenomenon [3]. By and large, colleges and universities have not yet begun to realize the promise of technology to improve the quality of student learning, increase retention, and reduce the costs of instruction. In contrast, the goal of the Program in Course Redesign is to support colleges and universities in their efforts to redesign instruction using technology to achieve quality enhancements as well as cost savings.

All 30 redesign projects focus on large-enrollment introductory courses that have the potential to affect significant student numbers and generate substantial cost savings. Why focus on such courses? Because undergraduate enrollments in the United States are concentrated heavily in only a few academic areas. In fact, just 25 courses generate about half of all student enrollments in community colleges and about a third of enrollments in four-year institutions. The topics of these courses are no surprise and include introductory studies in disciplines such as English, mathematics, psychology, sociology, economics, accounting, biology, and chemistry. Successful completion of these courses is critical for student progress toward a degree.

Each of the 30 participating institutions is conducting a rigorous evaluation focused on student learning, comparing the outcomes of redesigned courses with those of courses with the same content delivered in a traditional (pre-redesign) format. Twenty-two of the 30 projects involved in the program have shown statistically significant increases in student learning; the other eight have shown equivalent learning to traditional formats. Of the 24 projects that measured retention, 22 have reported a noticeable decrease in DFW rates, ranging from 10 to 20%.

Each institution has developed a detailed cost analysis of both the traditional and the redesigned course formats, using a spreadsheet-based course-planning tool [4] developed by the center. Preliminary results show that all 30 institutions reduced costs by about 40% on average, with a range of 20% to 77%. Other positive outcomes associated with redesigned courses include better student attitudes toward the subject matter and increased student satisfaction with the new mode of instruction.
The Program in Course Redesign has produced many different models of how to restructure such courses to improve learning as well as to effect cost savings. To counter the belief that only courses in a restricted subset of disciplines—science or math, for instance—can be effectively redesigned, the program contains successful examples in many disciplines including the humanities (6), math and statistics (13), the social sciences (6), and the natural sciences (5). What do these projects have in common? To one degree or another, all 30 projects share the following six characteristics:

1. **Whole course redesign.** In each case, the whole course, rather than a single class or section, is the target of redesign. Faculty begin the design process by analyzing the amount of time that each person involved in the course spends on each kind of activity, a process that often reveals duplication of effort among faculty members. By sharing responsibility for both course development and course delivery, faculty save substantial amounts of time while achieving greater course consistency.

2. **Active learning.** All of the redesign projects make the teaching-learning enterprise significantly more active and learner-centered. Lectures are replaced with a variety of learning resources that move students from a passive note-taking role to an active learning orientation. As one math professor put it, “Students learn math by doing math, not by listening to someone talk about doing math.”

3. **Computer-based learning resources.** Instructional software and other web-based learning resources assume an important role in engaging students with course content. Resources include tutorials, exercises, and low-stakes quizzes that provide frequent practice, feedback, and reinforcement of course concepts.

4. **Mastery learning.** The redesign projects add greater flexibility for when students can engage with a course, but the redesigned courses are not self-paced. Rather than depending on class meetings, student pacing and progress are organized by the need to master specific learning objectives, which are frequently in modular format, according to scheduled milestones for completion.

5. **On-demand help.** An expanded support system enables students to receive assistance from a variety of different people. Helping students feel that they are a part of a learning community is critical to persistence, learning, and satisfaction. Many projects replace lecture time with individual and small-group activities that take place either in computer labs—staffed by faculty, graduate teaching assistants (GTAs), or peer tutors—or online, enabling students to have more one-on-one assistance.

6. **Alternative staffing.** By constructing support systems consisting of various kinds of instructional personnel, the projects apply the right level of human intervention to particular student problems. Not all tasks associated with a course require highly trained, expert faculty. By replacing expensive labor (faculty and graduate students) with relatively inexpensive labor (undergraduate peer mentors and course assistants) where appropriate, the projects increase the person-hours devoted to the course and free faculty to concentrate on academic rather than logistical tasks.

Although all 30 projects have these characteristics in common, each has chosen a design model that implements the characteristics in a way that varies according to the discipline involved, the particular student audience, and the preferences of faculty. While the Program in Course Redesign is directed at a broad first-year student population at all types of institutions, we know that the redesign techniques have been particularly effective with minority students, community college students, and adult learners. For example,

- With an undergraduate minority student population of 46.4%, the University of New Mexico reduced its drop-failure-withdrawal rate from 42% to 18% in Introductory Psychology. At the University of Idaho, success rates in Intermediate Algebra for Hispanic students who are part of the College Assistance Migrant Program (CAMP) increased from 70% to 80%, and CAMP students surpassed the success rate for the entire algebra population as a whole.
• Two community colleges, Rio Salado College and Tallahassee College, respectively increased course completion rates from 59% to 65% in pre-calculus mathematics and from 56% to 62% in English composition.

• Two urban universities that serve a high percentage of adult learners, Florida Gulf Coast University and Indiana University-Purdue University Indianapolis, respectively reduced their DFW rates from 45% to 11% in a fine arts course and from 39 to 25% in Introductory Sociology.

To illustrate the impact of redesign on these at-risk and nontraditional students, brief case studies of redesign projects conducted by these institutions are presented here.

A. The University of New Mexico

Located in the heart of Albuquerque, the University of New Mexico (UNM) is one of only three Hispanic-Serving Carnegie Doctoral/Research-Extensive universities in the nation. With an undergraduate minority student population of approximately 46.4% (31.3% Hispanic, 5.5% Native American, and 9.6% other), UNM leads the nation’s research universities in student diversity. UNM students are primarily commuters who also work 30 or more hours per week.

UNM redesigned General Psychology, its largest and most popular undergraduate “killer” course, which enrolls 2,250 students annually [5]. UNM's primary redesign goal was to improve the course's extraordinarily high 42% DWF rate, 30% of which were failures and a disproportionate number of which were minority students. UNM has one of the lowest student retention rates among public research universities. High failure rates in core curriculum courses such as General Psychology are known to have a strong negative impact on UNM's low overall retention and graduation rates.

The course redesign reduced the number of lectures each week from three to two and incorporated a weekly 50-minute studio session led by undergraduate teaching assistants, strong students from previous sections of General Psychology, or upper-division honors students. In-class activities were supplemented by interactive web- or CD-ROM-based activities and quizzes, offered on a 24/7 schedule. Students were able to interact online with other students and review concepts based on individual need. Online components used commercially available software that contained interactive activities, simulations, and movies. Students took repeatable quizzes each week requiring a C-level mastery.

The asynchronous learning environment also included programmed self-instruction (PSI), a learning technique that provides the individual student a self-paced method of learning new information. Using a branching sequence of interconnected questions, PSI includes repetition, examples, illustrations, and anecdotes to convey important psychology concepts. An active intervention strategy ensured that students were making progress. Graduate teaching assistants monitored quiz performance, counseling students with weak performance as to how to improve.

UNM’s goal of reducing drop and failure rates in General Psychology has been achieved. The failure rate was reduced from previous levels of 30% to 12%, and the DWF rate fell from 42% to 18%. The number of students who received a C or higher rose from 60% to 76.5%, and there were more A and B grades than recorded in previous semesters. At the same time, the course was arguably more difficult, requiring students to cover completely a high-level introductory text.
B. The University of Idaho

Created in 1889, the University of Idaho (UI) is a comprehensive land-grant institution with principal responsibility in Idaho for performing research and granting the Doctor of Philosophy degree. UI offers 154 undergraduate majors, 71 master’s programs and 25 doctoral degrees, and is home to the state’s only law school.

UI redesigned three courses—Intermediate Algebra, Algebra, and Pre-Calculus—based on the Math Emporium model first developed at Virginia Tech [6]. The courses enroll a total of 2,428 students and were traditionally taught in a lecture format with assistance from a Mathematics Assistance Center. The traditional courses suffered from high DFW and repeat rates.

The prime objective was to move students from a passive learning environment to an active one in which the student controls and individualizes learning. Class meetings were eliminated; learning activities were moved to a learning center containing 72 computers in pods of four. Pods were designed for up to three students to work together at each monitor. Faculty, teaching assistants, and peer tutors worked with students individually and in groups. The courses used commercially-available math tutorial software that generated problems and offered immediate feedback. Short topical lectures were available on streaming video or video-on-demand. Since most of the course material was web accessible, students were not required to be in the center.

Students met weekly in focus groups of 40 to 50 students each to coordinate activities and discuss experiences and expectations. Aside from the weekly focus group meeting, students had the freedom to manage their learning time, types of learning activities, and rate of progress. Online bulletin boards and email provided a continuous means of communication between students and instructors.

Overall student performance as measured by grades based on comparable examinations and assignments has improved. In Algebra and Intermediate Algebra, the percentage of As and Bs was higher and the percentage of Cs, Ds and Fs was lower. In Pre-Calculus, the percentage of A and B grades also tended to be higher for redesign students, though the proportion of failures was not reduced dramatically. The redesign has been particularly successful with Hispanic students who are part of the College Assistance Migrant Program (CAMP). During the fall 2002 semester, however, these students achieved an 80% pass rate in Intermediate Algebra, compared with the previous 70% pass rate. CAMP students also surpassed the success rate for the entire algebra population as a whole.

C. Rio Salado College

Rio Salado College, one of 10 community colleges in the Maricopa County Community College District in Phoenix, places high value on creating convenient, high-quality learning opportunities for diverse population and specializes in customized programs and partnerships, accelerated formats, and distance delivery. Rio has been offering distance education for the last 20 years, with a focus on serving adult learners who work or have family commitments.

Rio redesigned four pre-calculus mathematics courses [7]. Before the redesign, the college had used mathematics software developed by Academic Systems to deliver its pre-algebra and college algebra courses via the internet. Although the internet classes showed a modest retention increase of about 2% over the print and mixed-media format of distance delivery, the overall retention rate was only 59%. Rio wanted to increase retention and to maintain or increase the number of students who completed the course
Using Asynchronous Learning in Redesign: Reaching and Retaining the At-Risk Student

with a grade of C or better.

Because the Academic Systems software presented course content so well, instructors did not need to spend time delivering content. Prior to the redesign, the majority of instructors’ time was spent troubleshooting technology problems, helping students navigate through the material, and advising students rather than helping them learn mathematics. The redesign added a nonacademic course assistant to address non-math-related questions (which constituted 90% of all interactions with students!) and to monitor students’ progress, thus freeing the instructor to concentrate on academic rather than logistical interactions with students. As a result, one instructor was able to teach 100 students concurrently enrolled in any of four math courses.

Rio took advantage of the Academic Systems software’s large bank of problems and answers for each topic to increase the amount and frequency of feedback to students. All assignments were graded on the spot by the software. Students knew what they had not mastered and were able to take appropriate corrective actions. Students could take end-of-module quizzes as soon as they were ready, moving quickly or slowly through the material. The software also provided a built-in tracking system that allowed the instructor and the course assistant to know every student’s status (both time on task and progress through the modules) in each of the four courses.

By using these techniques, Rio was able to increase completion rates from 59% to 65%, while tripling the number of students handled by one instructor. Using the Academic Systems software ensured that all students who completed the course successfully had the same kinds of learning experiences. This means that they were more consistently prepared when they moved to the next course in the sequence or to other courses requiring a mathematical background.

D. Tallahassee Community College

Since 1966, Tallahassee Community College (TCC) has worked to expand educational opportunities to learners through a variety of instructional delivery mechanisms and formats, specifically, web-based college-credit courses. TCC ranks first among Florida community colleges in the enrollment of African-American students, and first in the percentage who are A.A. degree completers. TCC’s number of minority graduates ranks 53rd in the nation.

TCC redesigned College Composition, a required course serving approximately 3,000 students annually. The traditional format, which combined lecture and writing activities in sections of 30 students each, made it difficult to address individual needs. Considerable class time was spent reviewing and reteaching basic skills, thus reducing the amount of time students had to engage in the writing process. Success rates were poor (less than 60% annually). Many students had to repeat the course, which placed a financial burden on the English Department and led to a heavy dependence on adjunct instructors.

The redesign had two major components. The first involved using appropriate technologies to provide diagnostic assessments resulting in individualized learning plans; interactive tutorials in grammar, mechanics, reading comprehension, and basic research skills; online tutorials for feedback on written assignments; follow-up assessments; and discussion boards to facilitate the development of learning communities. Students submitted midstage drafts to online tutors at TCC or to SMARTTHINKING, reducing the amount of time faculty spent grading papers. These activities took place outside the classroom and were accessible to students at any time.
The second component involved restructuring the classroom to include a wide range of learner-centered writing activities that fostered collaboration, proficiency, and higher levels of thinking. By shifting many basic instructional activities to technology, faculty could focus the classroom portion of the course on the writing process. Students worked in small groups or on individual writing efforts, depending on their identified needs.

During the 2002–2003 academic year, students in the fully redesigned sections had a 68.4% success rate, compared with 60.7% for the traditional sections. The overall success rate for all composition students was 62% for the 2002-2003 year, compared with 56% for the 1999-2000 year, representing a 13.6% decrease in the DWF rate. Faculty have observed that redesign students are more actively engaged in the learning process, are taking greater responsibility for their learning, are more independent and self-sufficient as learners, and are more adept at collaborative processes.

E. Florida Gulf Coast University

Opened in 1997, Florida Gulf Coast University (FGCU) was established to serve the needs of the southwest Florida region, one of the fastest growing areas in the United States. Located in Fort Myers, FGCU has experienced phenomenal growth for the past three years. FGCU is committed to increasing access to quality academic programs that emphasize student learning while controlling costs through creative teaching and course-delivery practices.

FGCU redesigned Understanding the Visual and Performing Arts, a required course in its general education program, to accommodate enrollment growth and achieve greater coherence and consistency [8]. FGCU’s goal was to increase the number of As and Bs and to decrease the number of Ds and Fs. All students were moved into a single, fully online section, using a common syllabus, textbook, set of assignments, and course, website. Students were placed into cohort groups of 60 and, within these groups, Peer Learning Teams of six students each. The redesign allowed FGCU to maintain the most important elements of humanities courses—active engagement with ideas and a collaborative and experiential learning experience—while eliminating seat time completely.

The course included three modules, each of which had the same format, including an exam with both short-answer questions and a short-essay question. After reading chapters in the text, students repeatedly took low-stakes quizzes that provided feedback in preparation for the objective portion of the module exam. To prepare for the essay portion, students participated in web board discussions with their Peer Learning Teams, analyzing sample essays. These discussions increased interaction among students and developed critical thinking skills. Students also attended two arts activities in the community to gather material for two longer critical-analysis essays.

In the area of content knowledge, students demonstrated a markedly enhanced level of learning in the redesigned course. The average score on standardized exams in the traditional course was 72% and 85% in the redesigned course. The percentage of As and Bs on standardized exams went from 37% to 77%, and the percentage of Ds and Fs went from 37% to 10%.

F. Indiana University-Purdue University Indianapolis

Indiana University Purdue University at Indianapolis (IUPUI) is an urban research university created in 1969 as a partnership by and between Indiana and Purdue Universities. Because it grants degrees in 185 programs from both universities, IUPUI offers the broadest range of academic programs of any campus in
IUPUI ranks among the top 15 in the country in the number of first professional degrees it confers and among the top 5 in the number of health-related degrees.

IUPUI redesigned Introduction to Sociology, which enrolls approximately 2,000 students annually, to encourage greater collaboration among students, increase student learning, and improve student success rates [9]. In the traditional course, 39% of students received a D or F or withdrew from the course. The traditional lecture-and-testing format did not offer students the opportunity to learn collaboratively from one another. The course redesign involved eliminating the multiple-section course format and substituting a common format that included online learning modules, threaded discussions, interactive computer-based testing and an interactive research module.

Collaborative learning theory suggests that the more often students are able to engage in extended discussion about the course material, the more likely they are to learn it. The redesign introduced collaborative computer work in a research module common to all sections, with a special focus on the collection and analysis of data. The software also created a common discussion space that allowed all students (resident and commuter, traditional and nontraditional) to work collaboratively without location and time restrictions.

A traditional problem with classroom-based groups on IUPUI’s urban campus is that students have trouble meeting with each other. Increasing the ease and amount of communication is especially important in large sections where instructor-student and student-student interaction is often inhibited by class size. Interactive testing allowed students to take exams outside of class, which freed in-class time for additional student-faculty interaction. A course management system allowed faculty to monitor students’ progress and participation, permitting early intervention in problem situations.

In the fall 2000 pilot, the percentage of students receiving a D or F or withdrawing dropped from 39% to 33%; in spring 2001, it was 30%; in fall 2001, it dropped to 25%. In fall 2000, students in redesigned sections had higher (.10 level) grades. In spring 2001, redesign students had significantly higher (.05 level) grades than those in the traditional format. Finally, in fall 2000, a difference-of-means test showed that students in redesigned sections scored significantly higher (.05 level) on a set of common questions measuring understanding of key sociological concepts.

III. CONCLUSIONS

In addition to experiencing the generic quality and cost problems faced by all colleges and universities, community colleges face problems particular to their student populations. They need to design more flexible schedules for working adult students, create a greater sense of community or engagement for commuting students, address the special needs of English-as-second-language students, and serve at-risk students more effectively. The Program in Course Redesign has shown how information technology and asynchronous learning strategies can be used to address these challenges when combined with proven pedagogies, and do so while reducing instructional costs. The six institutions described in this article reduced their course costs on average by 35%, with a range of 20% to 42%. Their successes are easily transferable to community colleges throughout the country. The result: greater learning for less cost and, most importantly, more students able to achieve their academic goals.
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THE VALUE OF ONLINE LEARNING: PERSPECTIVES FROM THE UNIVERSITY OF ILLINOIS AT SPRINGFIELD

Burks Oakley II
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ABSTRACT
The value of online learning is analyzed from the perspective of the University of Illinois at Springfield (UIS). The first type of value (merit, worth) of online learning is discussed, with the conclusion that online learning is of significant value to various constituencies, including students, faculty, the institution, and society. A second type of value (cost-benefit) of online learning is analyzed and seen to be outstanding at UIS, compared to other online alternatives. Finally, the two types of value of online learning are related to the Sloan-C quality pillars.

KEYWORDS
Online Learning, Quality Pillars, Cost-Benefit

I. INTRODUCTION
Since the release of the first graphical web browser, Mosaic, by the University of Illinois in 1993 [1], the Internet has grown exponentially, permitting new and rapid access to information and improved interpersonal communication. Building upon the Internet, online courses and degrees developed using the concepts and principles of asynchronous learning networks (ALN) have fundamentally altered the face of higher education in America, specifically in the area of distance education and lifelong learning. In just a few short years, ALN has become the predominant distance education medium, quickly outpacing and replacing all other delivery modes [2, 3].

A recent review of statewide online initiatives showed that Illinois ranks first in the nation in online enrollments on a per capita basis [4]. The latest report from the Illinois Virtual Campus found that there were more than 50,000 enrollments in over 3,700 online courses offered by Illinois colleges and universities during the Fall 2003 semester [5]. In this same report, the University of Illinois at Springfield (UIS) ranked number one in enrollment in for-credit online courses of all public four-year institutions in the state.

Since offering its first online class in the Fall 1998 semester, UIS has developed online baccalaureate degree completion programs in English, History, Computer Science, and Liberal Studies, an online master of science degree in Management Information Systems, and an online master of arts degree in education (Master Teaching and Leadership, MTL) targeted to in-service K–12 teachers. The enrollment in these programs has grown steadily: the Liberal Studies online program enrolled its first students in 1999, and now has 229 online majors and is the second-largest major in the College of Liberal Arts and Sciences (CLAS); the MTL program currently has an enrollment of 220 (this degree, which was first offered in the
Fall 2000 semester, is only available in an online format).

During the Spring 2004 semester at UIS, almost one in three students took at least one online course and one in six students took online courses exclusively. More than one-third of UIS faculty (and more than half of the faculty in CLAS) now has experience teaching an online course. The UIS campus has developed an infrastructure to serve online students, covering areas from technology to student advising. Retention in online classes at UIS in recent semesters has averaged greater than 94%, which is comparable with on-campus retention. In the Spring 2004 semester, 18% of all course credits offered by the UIS campus were generated by online courses. In the summer of 2003, the Board of Trustees of the University of Illinois approved e-tuition for the UIS campus. Residents of Illinois automatically qualify for e-tuition, while out-of-state students qualify for e-tuition during a particular semester if they are enrolled in an online degree program and only take online classes that semester. For the Spring 2004 semester, e-tuition at UIS is $115.00 per credit hour (undergraduate) and $129.50 per credit hour (graduate) [6]. Students enrolled in online courses also pay fees amounting to $32 per credit hour [6].

The online degrees at UIS build on the strength of CLAS, with degrees in liberal arts and sciences—not just the “low-hanging fruit” of business administration and information technology offered by so many other institutions. The campus offers the only online baccalaureate degree completion programs in traditional disciplines of any public four-year institution in the state of Illinois, and one of the few online master’s degrees (MTL) in the United States that prepares in-service K–12 teachers for national master teacher certification by the National Board of Professional Teaching Standards.

The UIS campus now has been offering online courses and degrees for five years. Given this past history, as well as the expressed goal of continued expansion of the online program at UIS, it is worth addressing the concept of value related to online learning, especially at UIS. It is hoped that the lessons learned about the value of online learning at UIS can be generalized and will have broad applicability at other institutions.

The American Heritage® Dictionary of the English Language [7] offers several definitions for the word “value,” including:

1. Worth in usefulness or importance to the possessor; utility or merit: the value of an education.
2. An amount, as of goods, services, or money, considered to be a fair and suitable equivalent for something else; a fair price or return.

Both of these definitions—(1) the importance of the online learning experience to an individual or entity (termed “Type I” in this paper), and (2) the perceived fair price of an online education (termed “Type II” in this paper)—are worth considering within the context of online learning. The following sections analyze the value of online learning at UIS in light of these two definitions.

II. THE VALUE OF ONLINE LEARNING TO VARIOUS STAKEHOLDERS

It is natural to think first of the Type I value (merit, worth) that online learning has to students enrolled in online degree programs. But there also is value in online learning to a number of other stakeholders—faculty, on-campus students, the institution, and society.
Value to New (Distant) Students: Online courses and degree programs make it possible for students to earn a degree from any location in the world from which they have reliable access to the Internet. Online degree programs have become especially popular among non-traditional students, such as returning adult students who have full-time jobs and family responsibilities. For many of these individuals, online programs provide their only chance to earn a college degree. In fact, online courses have provided a population of single working parents access to educational opportunities that they have never previously had. The value of online learning to these groups of new learners is obvious: access to quality online degree programs that will not only provide credentials and knowledge needed to advance their careers, but also will give them a strong sense of accomplishment, personal satisfaction, and life enrichment.

I cannot express in words how I feel about being an online learner at UIS. I love UIS and praise it often. Other single mothers and I chat in classes and agree that the atmosphere of learning online is wonderful. You are able to learn not only from the course experience but from other learners in other states, and you all come together for the same goal—to learn. I work full-time, and I am a divorced mother with sole custody of a 2-1/2 yr. old, 24 hours a day, 7 days a week. I made the Dean’s List last semester taking 10 semester hours. There is something to be said about the quality of UIS and the courses and professors, because even when I was single and attended classes, I could not do this!

Leigh P. George, New Albany, MS
UIS Online Student, Liberal Studies

Value to Faculty: Faculty who teach online realize a number of direct benefits. One of the most important benefits is that they devote time to learning about online education, through seminars, workshops, and informal discussions. They report that this study of the teaching and learning process improves their classroom teaching and their student teaching evaluations. Many UIS faculty enroll in online professional development courses in the area of online teaching and learning offered by the Illinois Online Network (ION) [8, 9], and a number of these faculty go on to earn ION’s Master Online Teacher certificate [10]. Faculty develop approaches to online teaching that are more student-centered than traditional lecture courses have been. Faculty teaching online also become comfortable using computers and Internet technologies, gaining skills that are invaluable to possess in the first decade of the new millennium. Faculty then carry these new approaches to student-centered learning and effective use of Internet technologies over into their on-campus teaching. As an example, during the Spring 2004 semester at UIS, approximately two-thirds of the courses that had accounts in Blackboard (the course management system used at UIS) were on-campus classes. Another benefit to faculty is that they often interact more closely with the students in their online classes, getting to know the students better. This increased level of interaction is reported to be a factor in faculty returning semester after semester to teach additional courses online [11]. Faculty at UIS who teach online interact with a broader range of students (not just those in central Illinois); these students bring new and interesting perspectives to the online classroom. Finally, UIS is an institution that encourages faculty to become involved in the scholarship of teaching [12], and UIS faculty are finding that data obtained from their online teaching gives them additional opportunities to present at conferences and to publish in peer-reviewed journals.

Online teaching has given me the opportunity to impact, and be impacted by, a diversity of students that I would never have in a traditional classroom. The interaction and learning that occurs in my online courses continually uplifts me and makes me glad I am a teacher.

Elizabeth Saunders
Adjunct Faculty, UIS
Your e-mail note prompted me to think about where I find value in teaching online, from a faculty perspective. I truly believe that I get to know a higher percentage of my students better in the online format. I find that students communicate more freely. I also appreciate that I don’t have to repeat the same lecture again and again; rather I can focus on the true learning aspects of interaction with students. But, I suppose most important for me is that I feel that I am reaching students who otherwise could not or would not complete their degrees or pursue a graduate education. Just this morning, I received an email from a very sharp student — the technology director at an urban library in the Chicago area. His experience in my “Emerging Technologies” class was his first exposure to a seminar. He was energized by pursuing research and sharing literature critiques and research with others in the class. It is there, in the excitement of bringing something new to these students, that I find a special personal satisfaction, value of the first type, in teaching online.

Raymond E. Schroeder
Professor Emeritus, UIS

Value to Existing Students: Another constituency that derives benefit from an institution’s online program is on-campus students. As faculty teach online, they think more about the overall learning process, their approaches become more student-centered, and they make effective use of educational technologies. They then carry their new approaches into the classroom, benefitting their on-campus students. In addition, when an institution makes its student support services available to online (distance) students, the on-campus students quickly move to make use of these more convenient services. Finally, at UIS, a number of part-time commuter students mix online and on-campus courses during the same semester. While they may only have the time in their busy lives to take one course on-campus, the “anytime-anyplace” convenience of online courses allows them to take an online class in addition to an on-campus class, thus enabling more rapid progress towards their degrees.

Value to the Institution: An institution offering online degree programs can attract new students, thus increasing enrollment and tuition income. For reasons outlined above, institutions also can better serve existing students. In the case of UIS, the development of online degree programs and e-tuition has enabled the institution to progress from a regional campus, which served a limited number of residential students and commuter students living within a thirty mile radius of Springfield, to an institution with a national perspective and reputation, enrolling students from across the United States and indeed from other countries around the world. To advance this transformation, UIS has developed partnership agreements with community colleges throughout the country with strong online programs. This effort has boosted the campus’ national visibility while attracting students who already have experience with online education [13]. The increased tuition revenue from the online program has enabled the campus to hire additional tenure-track faculty in key areas, with the added advantage that the campus can offer a more diverse set of electives on-campus and online as new faculty bring in new specialties. Finally, since UIS was founded (as Sangamon State University, SSU) with a mission of offering baccalaureate degree completion and selected master’s degrees, the online program expands the ability of the campus to deliver on its core mission.

As far as the value to us, there are several points to emphasize. First, UIS/SSU has always lived on its ability to serve the “non-traditional” student. Night courses, weekend courses, Peoria courses, TV courses and the like have made up the majority of our credit generation since day one. Online courses are a logical and necessary extension of those efforts to provide access to the “non-traditional” student. We need to be doing these things in order to stay in touch with our primary clientele.
While we have lost many faculty lines [due to budget cuts in the past few years], we also have hired new faculty with a wide range of specializations. These hires have been possible because enrollment in the college has risen dramatically in recent years. The 200 online majors and the 200 or so Capital Scholars [freshman and sophomores] account for that growth. The online initiatives make it realistic to add a philosophy major, for example, or to grow smaller programs such as mathematics to ensure their future viability. The resulting growth in majors and enrollments in many programs gives them additional faculty lines to cover critical curricular needs that have existed for much of our history.

Bill Bloemer, Dean
College of Liberal Arts and Sciences, UIS

Value to Society: Society as a whole benefits from the non-monetary effects of higher education, independent of the delivery mode by which a college degree is earned. College graduates are more likely to vote, to have regular health care, to raise healthier children, to volunteer, and to raise children with higher measures of educational achievement. Overall, there is a strong relationship between having a college degree and measures of health, community involvement, and cultural participation, all of which have value (Type I) to society [14]. Society also benefits directly from the monetary effects of higher education, since college graduates earn and spend more, and pay more taxes than those without college degrees.

III. THE VALUE OF ONLINE LEARNING AT UIS

Why is the online program at UIS growing so rapidly? One answer is that students perceive the online learning experience to be a good value for their tuition dollars (Type II, cost-benefit).

Fathom, an online venture created by Columbia University in 2000 to offer digital content from Columbia and thirteen other academic and cultural institutions, failed partially because potential students did not want to pay a relatively high price for the Fathom product. “Fathom failed to persuade people to pay for what they thought they could get free in other forms” [15]. One can assume that the perception by potential students was that Fathom was not a good value for the money. On the other hand, UIS is viewed by online students as a great value. The cost (tuition and fees) of online courses at UIS is one of the lowest of any public institution in the U.S.A., and much less than that of a private institution. Also, Fathom chose not to capitalize on the nationally recognized and respected brand names of its providers. Name recognition and the reputation of the University of Illinois make the UIS online programs an especially attractive choice for students who care about quality.

In the past few years, the UIS campus administration realized that the existing policy for out-of-state tuition (essentially three-times the in-state rate) was making it very difficult to attract out-of-state students. Despite the high quality of the online programs, it is likely that the high tuition caused potential students from outside of Illinois to perceive these programs as not a very good value (Type II). However, the new e-tuition rate for UIS implemented in the Fall 2003 semester changes this perception completely. Out-of-state students are now finding UIS and enrolling in online degree programs, simply because the programs are now of such high value. The campus administration expects to see significantly increased enrollments by out-of-state students, leading to economies of scale for the entire online program.

As mentioned in Section I, e-tuition at UIS is $115.00 per credit hour (undergraduate) and $129.50 per
credit hour (graduate) for the Spring 2004 semester. By comparison, tuition for online programs at other institutions is much more:

- University of Phoenix (undergraduate) – $440/credit hour
- University of Phoenix (graduate) – $545/credit hour
- Franklin University – $224/credit hour
- Capella University – $319/credit hour

Within Illinois, several universities offer online baccalaureate degree completion programs, with tuition ranging from $130.50/credit hour at Western Illinois University to $348 per credit hour at DePaul University to $500/credit hour at the University of St. Francis. At the graduate level, a number of universities in Illinois have online programs, but again, the tuition costs are much more than at UIS; for example, $451/credit hour at National-Louis University and $280–$590/credit hour at the University of Illinois at Urbana-Champaign.

In choosing to complete the online courses and degree programs, students do make value judgments for both personal and monetary reasons. I recall students saying that, in comparison to other schools, UIS was a good dollar value. UIS tuition is very affordable in comparison to what some other 4-year institutions are charging students. Students are able to complete a 4-hour course for less than $600. At other institutions, a similar course offering is about $1,000. Students also chose the online degree program because they would get a degree from the University of Illinois.

Gail Taylor
UIS Graduate
B.A., Liberal Studies, 2000

IV. RELATIONSHIP TO THE QUALITY PILLARS

Mayadas first used the metaphor of the “five pillars” that support quality in online education [16]. The five pillars are learning effectiveness, access, student satisfaction, faculty satisfaction, and cost effectiveness. The Sloan Consortium has adopted these five pillars as part of its quality framework [17, 18]. It is worth examining the pillars in light of the two types of value of online learning described above.

Learning Effectiveness: Students now realize that online learning can be as effective as classroom-based learning (or, for some, more effective), and thus online learning has the same or greater value (type I; merit, worth) for them as classroom learning. Online students view their degrees to be completely equivalent to degrees earned on-campus—and perhaps more valuable, since earning degrees online demonstrates that they have the drive and determination to do all this from a distance, while gaining new knowledge about the Internet and collaboration.

I would not be receiving my BA in December 2003 if it were not for the online learning classes made available at UIS. I love the classes and have learned so much. One thing that makes me angry is people will comment that online learning is so easy. I disagree totally! I have found that you must be very dedicated, organized, and motivated to do online learning and it is not for everyone. I have worked much harder in my online classes than I ever did in the classroom. I have also found that I am able to listen to others before voicing my opinions so quickly, because being in online classes you have time to think about what others are posting before responding, and you try to think about their views even if they are different from yours. I think that is a great quality to learn to listen to others’ views. I have worked very hard in my classes and it can be
very time consuming but it is worth it to me to be able to learn from my home when it is convenient!

Mary Jo Jannsen
UIS Student, Liberal Studies

Access: Many online students today would not be enrolled in degree programs if these programs were not available online. These online programs make it possible for place-bound and time-restricted individuals to work towards a degree. Distant students not only have access to online courses and degrees, they also have online access to a wide range of student support services (advising, library, help desk, etc.). The implementation of e-tuition at UIS has certainly given students throughout the nation new access to affordable online degree programs. Thus, the access pillar can be seen as both Type I value (the merit or worth of being able to complete a degree in an anytime-anyplace format) and Type II value (a fair price for the good or service).

I could write pages why online learning is so important to me. I work full-time and have 3 children and 2 granddaughters, plus I live 30 miles from Springfield. It took me 8 years to get my Associate’s Degree by attending classes on campus at Lincoln Land Community College at night. I was so tired and ready to go home to be with my family but instead I went to school. After I finally got my Associate’s I decided that my family was more important and I should be happy with that and decided no more school. Then, 5 years later, I decided I wanted to get my BA and took one class on campus. I was miserable and I made it through the class but decided I was too old and too tired to go 2 nights a week for 8 more years so I was going to be done. Then a classmate told me about the online program at UIS. I called the next day and talked to Sharon Chanley [UIS faculty member]. She convinced me over the telephone that online learning was for me and that I should at least give it a try. She talked me into taking two online classes (one to plan and map out my degree proposal and one to get credits for prior learning). I did it and loved it! I must be honest — in the beginning I was scared to death. I work on computers at my job but had no idea how to use search engines and do research online. I loved the two classes I took with Sharon Chanley and she was also my advisor. One of the most encouraging and motivated professors I had ever had. Since then, I took at least 8 hours and sometimes 12 hours a semester and I will graduate in December 2003 with a BA in Liberal Studies with a focus on Aging and Gerontology. My dream of getting my BA will actually be a reality!

Mary Jo Janssen
UIS Student, Liberal Studies

Student Satisfaction: Students are enrolling in online courses, semester after semester. They are telling their friends about the quality of online learning at UIS. They are very pleased with what they are learning and they are also pleased with the student support services to which they have access. As with the access pillar, the student satisfaction pillar really addresses both types of value: the intrinsic worth of the knowledge to individual students and the reasonable price of the online courses.

As a lifelong resident of central Illinois, my heart belongs to the University of Illinois. As a young girl, I did not have the confidence to achieve the goal of a UI education. It was a dream I never thought possible. However, I did complete an Associate’s degree from Parkland College in Liberal Arts.

As my life choices were made, I constantly felt a void for not completing a bachelor’s degree at
UI. Even though I had a successful sales career, I did not feel complete. When I became a single mom, I realized the education was necessary.

In 1998, I saw information about online education and began to investigate how it worked. I researched and took a few initial online courses at a private college. However, when I heard about UI offering a bachelor’s degree online, I immediately made the contact. Fortunately, the telephone call to Andy Egizi [advisor in CLAS Online office] was the right decision! I will graduate in Spring 2004 with my degree from the University of Illinois!

Why UI? It is very simple—the people! From the initial call to every faculty and staff member at UIS, my experience has been fantastic! I can name many individuals who have worked patiently with me to achieve my goal. There is a spirit of unity and family woven through the program. Not only are these team members professional, they are devoted to building and promoting the program. There is no prejudice, jealousy or egotism among them. They respect each other and this bond is evident to all. They do not try to pull the spotlight on them personally. They know the value of their team and genuinely believe in their work.

In addition, besides the people, I believe it is a trust issue. For a single person in her mid-40’s, I sought a safe haven. This may sound strange, but embarking on such a dramatic life change, I was terrified! I found this ‘security’ at UIS. When I submit an assignment, I know it will be treated fairly and with confidentiality.

Of course, I chose UI for its reputation and prestige. When I visualize this document hanging in my office and added to my resume, I will be so proud. Not only for my accomplishment, but for the doors it will open for me.

Georgianna H. Frye
UIS Student, Liberal Studies

Faculty Satisfaction: Faculty are finding value (Type I, merit, worth) in their online teaching. They very much enjoy getting to know their online students on a very personal level through daily interactions, and they find positive benefit in having a more diverse group of students in their online classrooms. They also are enjoying the anytime-anyplace aspects of online teaching (as online teachers often joke, being able to teach from home while wearing pajamas).

Through online teaching, I am able to interact closely with each student and have enjoyed watching student beliefs develop and change through the challenges presented by course content, an event that cannot always be observed and subsequently nurtured for every student in the traditional setting. Although I believe that students who choose to take online courses are often more intrinsically motivated, I also suspect that the demands presented by online courses may build students’ feelings of efficacy, challenge, and ultimately competence. As a result, I believe that the online educational environment offers not only convenience for students, but also the potential to present and evaluate content in a manner that enhances learning and not simply performance.

Tara Stevens (2002)
Formerly an Assistant Professor, UIS [now a faculty member at Texas Tech]
I have taught several undergraduate and graduate classes online. My students are from all over Illinois and increasingly from other states. Feedback from students has been very favorable and appreciative, especially from women who are at home raising kids, business people who travel a lot, and those who are busy and trying to juggle jobs, family and school. I am particularly pleased that if a course is well designed, it can actually be a better learning experience (due to student-student and student-teacher interaction) than on-campus classes.

David O’Gorman
Professor, UIS

Cost-Effectiveness: The American Heritage® Dictionary of the English Language dictionary defines cost-effective as “Economical in terms of the goods or services received for the money spent.” [7] Thus, cost-effectiveness is another term describing Type II value as used in this analysis. Students certainly view online learning at UIS to be cost-effective, and they comment that the UIS online education is indeed affordable to them. They realize that the UIS e-tuition is a very fair price to pay to earn a degree with the University of Illinois brand name, and the financial costs of earning their degrees online are good investments in their future.

With regards to ‘cost,’ there is no dollar amount one can put on education. However, I have thought about the hours of time various faculty/staff have spent with me. If they had been attorneys, it would have cost a small fortune. I know it is an exceptional value for the monetary investment.

Georgianna Frye
UIS Student, Liberal Studies

V. CONCLUSIONS

Online learning at the University of Illinois at Springfield has been analyzed from the perspective of two types of value. Online learning is seen to be of value (Type I value, merit and worth) to distant students, on-campus students, faculty, the institution, and society. The online program at UIS is perceived by students to be an outstanding value (Type II value, cost-benefit), especially with the e-tuition rates recently implemented by the campus. The analysis of value and online learning at UIS presented in this paper provides strong support for the logic and reasoning behind the Sloan-C quality pillars.

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VIII. ABOUT THE AUTHOR

Burks Oakley II is the Associate Vice President for Academic Affairs at the University of Illinois and serves as the director of University of Illinois Online. His areas of interest include distance education, outreach, and instructional technologies on all three campuses of the University of Illinois (Chicago, Springfield, and Urbana-Champaign). Through his innovative use of technology in teaching, Oakley has earned a national reputation as a practitioner and promoter of online education. In the past five years, he has given more than three hundred invited talks at national conferences and on university campuses.

Oakley received his B.S. degree from Northwestern University and his M.S. and Ph.D. degrees from the University of Michigan. He has received numerous awards for his teaching and innovative use of technology in education, including the Luckman Distinguished Undergraduate Teaching Award from UIUC in 1993, the Outstanding Teacher Award from the American Society for Engineering Education (ASEE) in 1993, the Educom Medal in 1996, the Major Educational Innovation Award from the Institute of Electrical and Electronics Engineers (IEEE) in 1996, the Meritorious Service Award from the IEEE Education Society in 1998, the IEEE Third Millennium Medal in 2000, the Achievement Award from the IEEE Education Society in 2002, the Engineering Alumni Society Merit Award from the University of Michigan in 2003, and the Sloan-C Award for the “Most Outstanding Achievement in Online Teaching and Learning by an Individual” in 2003. He is a Fellow of the IEEE and the ASEE, a former Vice President of ASEE, and a member of the Board of Directors of the Sloan Consortium.
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