Explaining his uncanny knack for being in the right place at the right time, the hockey star Wayne Gretzky gave us the concept of “skating to where the puck will be.” This idea applies to colleges and universities today. The challenge for academic leaders is to start skating to where the Internet-lubricated higher education puck will be tomorrow. The Internet is raising expectations for change and taking the friction out of the change process. As a revolution in human communication and resource sharing, the Internet provides obvious leverage for the knowledge transactions that are at the heart of scholarship and instruction. E-learning—the use of the Internet in teaching and learning—is “where the puck will be” for those seeking to increase the learning outcomes and the convenience of instruction in any configuration of place and time, including the convenience of virtual (anyplace-anytime) instruction as a means to increase access to education.

But these educational goals—increasing instructional effectiveness, convenience, and access—have always been achievable at some cost. So a parallel challenge is to achieve these goals in an affordable model that optimizes the learning productivity of the overall investment in higher education, and this is where the Internet as a partnering medium enters the puck’s trajectory. The Internet’s capacity for improving communication and resource sharing also provides leverage for intra-institutional, inter-institutional, and institutional-commercial relationships (partnerships) aimed at dividing and conquering thorny resource issues.

Partnering can present special challenges to the traditional college...
For the traditional campus, the costs of going it alone are high relative to the costs of relying on virtual operations—that is, contracting or partnering for capital, infrastructure, and services in the Internet economy. and attracting private capital to an entity that carries the opportunity for an appreciation in the value of such investments. Just as traditional bricks-and-mortar retailers, ranging from Wal-Mart to Neiman Marcus, face the challenge of transitioning to new bricks-and-clicks retail models, so do traditional colleges and universities face the challenge of transitioning to new bricks-and-clicks e-learning programs. The competitive edge lies not just in the convenience and quality of the resulting e-learning programs but in the underlying economics of the transition and the long-term economic viability of the operating services model chosen to undergo the new programs. To understand the latter point, we need a theory of virtual operations.

A Theory of Virtual Operations

The concept of virtuality has an operations dimension with origins in the work of Nobel Laureate Ronald Coase, and this dimension of virtuality can be as essential to a successful e-learning offering as is virtual (anyplace-anytime) campus design and delivery. Coase's contribution, in simplified terms, derives from his observation, dating to the 1930s, that competitive advantages of the operating service to reduce transaction costs between buyers and sellers—or, in nonprofit terms, that service organizations exist to reduce transaction friction between service receivers and service providers. For example, traditional campuses typically group content experts into faculties and aggregate instructor-specified courses into programs to reduce the otherwise chaotic friction that would prevail if there were no institutions to simplify the decision-making process as well as those of the knowledge economy and the transition to the Internet economy. The same time that technology is giving institutions new opportunities to reconfigure their traditional offerings and even to introduce new services for new audiences, it is opening their traditional markets to new competitors. And the growing lifelong learning needs of the knowledge economy and the convenience of anytime learning for adults are resulting in new virtual-campus offerings from for-profit learning providers and from brand-name private and public research universities. In some of the latter, the new virtual-campus opportunities are raising a host of intra-institutional academic cultural issues that have led to the creation of for-profit virtual-campus subsidiaries. These subsidiaries are typically arm's-length vehicles for insulating the virtual campus from its nontraditional mission from the culture of the traditional academic while retaining control over the academic substance of the virtual campus and investing institutional resources in and attracting private capital to an entity that carries the opportunity for an appreciation in the value of such investments.1 Just as traditional bricks-and-mortar retailers, ranging from Wal-Mart to Neiman Marcus, face the challenge of transitioning to new bricks-and-clicks retail models, so do traditional colleges and universities face the challenge of transitioning to new bricks-and-clicks e-learning programs. The competitive edge lies not just in the convenience and quality of the resulting e-learning programs but in the underlying economics of the transition and the long-term economic viability of the operating services model chosen to undergo the new programs. To understand the latter point, we need a theory of virtual operations. 

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Competitors. Many educational goals can be achieved nimbly and cost-effectively by outsourcing selected operations—that is, instituting virtual operations—and by connecting learners to virtual learning opportunities delivered dominantly in anyplace-anytime mode with little recourse to someplace-sametime, someplace-anytime, and anyplace-sametime modes. Here, anyplace is used to imply no or little responsibility on the part of a service provider to provide for facilities or technologies; for example, the service receiver is responsible for access to an Internet-connected PC.

The place-time services taxonomy used above is depicted visually in the two-dimensional place-time continuum shown in Figure 1. The accompanying three-dimensional continuum adds the third dimension: operating functions provided internally or externally to deliver those services. The sweet spots of virtuality are boxed in as four-star spaces—the "virtual spaces." In any service offering, there is a service receiver and a service provider—in commercial terms, a buyer and a seller. A service receiver is likely, for reasons of convenience and access, to find favor in virtual anyplace-anytime service offerings while caring little about the service provider's costs of providing the services. Yet the service receiver may be sensitive to pricing differences among competing service offerings. And that is why service providers operating in competitive service markets have to consider their operating costs relative to those of competing providers. In the context of higher education, this simple observation translates to the challenge of finding a balance between cost-effectiveness and accessibility.
If online learning materials are to provide the opportunity for effective learning in a self-study environment, they must rise to the level of "learningware," a software application informed by research in learning theory to provide structured opportunities for active learning.

New Roles for the Traditional Higher Education Faculty
These trends toward a market-driven disaggregation of postsecondary education and training services will have an impact on the role of the traditional higher education faculty. Traditional higher education, although not a one-size-fits-all education marketplace, has historically practiced an instructor-led, contact-hour course model. And there will continue to be a role for instructors in higher education. But that role is changing, even in the market for a residential general-education experience for traditional "college-age" students. To understand this evolving role, we must first examine the niche for formal instructor-less learning, as small as it may be, and the real issue it raises: the relationship between self-study learning and instruction. We will then explore the role of the instructor in student learning and e-learning and discuss two paths for engaging and supporting traditional-campus faculty.

Instructor-Less Learning
Even at the baccalaureate level, there are some precedents for rewarding instructor-less learning with credit hours. Many colleges and universities, for example, award credit for selective levels of accomplishment on the Advanced Placement Examinations, whether students studied on their own or in instructional programs offered elsewhere. And as the demand for continuing professional development, corporate training, and other forms of adult education increases, so may the demand for instructor-less learning opportunities. Postbaccalaureate learning needs, after all, can sometimes be at odds with the needs of the traditional-campus faculty.

Placement Examinations, whether state-mandated or otherwise, provide a powerful form of anyplace- anytime learning that can also be cost-effective provided that the capital costs of developing the study materials can be amortized at a low per-student cost and that the need for instructional labor is kept to a minimum. Perhaps for this reason, some instructors today envision an instructor-less future in which the courses they teach will be available for self-study on the Internet, generating revenue for their "greedy" institutional employers who forced them, against their long-term financial self-interests, to develop these virtual courses. But these same instructors are likely confusing the provision of "their" content online—online "publications" of their content—with effective online teaching. Except in the circumstances described above, in which highly motivated and well-prepared students have learned to learn on their own, the simple delivery of content in any medium seldom results in an effective learning experience.

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The EDUCAUSE Institute
The EDUCAUSE Institute is designed as a professional development program for those who manage information technology and resources in higher education, whether within their department or for the entire institution.

The New Ecology of Postsecondary Education
As noted, Internet-based opportunities are driving new services and increased competition in many segments of the postsecondary education and training market, particularly the postbaccalaureate segment. Increased competition is in turn opening the market and deregulating historic controls that have allowed some traditional education and training providers to operate under the protection of local and regional geopolitical forces. Demographic changes in the postsecondary education and training market, driven by the emerging knowledge economy's emphasis on lifelong learning, are also fueling the trend toward a vigorous market economy of learning services for adults—continuing education and professional development that is learner-centric and employer-centric. These trends portend serious changes in the nature of public and private investments in postsecondary education and training. It is conceivable, for example, that state and local governments will reframe their investments in educational opportunity and access to education. They might decrease their tax-funded subsidies to public universities and colleges, including community colleges, and redirect some of the savings to individuals who qualify for an accredited course of study—a form of post-secondary educational vouchers. For instance, Georgia already dedicates lottery proceeds to scholarship funding that goes directly to qualifying Georgia students, and other states are in the midst of similar initiatives. It takes only a moment’s reflection on the recent and rapid changes in funding and delivering health care in the United States to foresee the viability of the EMO (educational maintenance organization). The EMO would use an investment—funded by the employee, the employer, and in some cases, the government—to provide lifelong access to educational opportunities for members of the employee’s immediate family. All of these Internet-enabled changes will almost certainly result in increased educational opportunities in many segments of the postsecondary market. And just as the Internet is generally making a commodity of the virtual delivery of a multitude of services that used to be less accessible, more generic than niche-oriented, and often more expensive, these new educational opportunities will make postsecondary education much more a consumer commodity than it is today. At the same time, virtual operations models based on Coase’s work will reduce the barriers to entering these niche markets and thereby increase competition. Increased competition, along with the reduced transaction costs enabled by virtual-campus constructs, will tend to drive down the market price of education and training services.

Management Program
Boulder, CO
June 10–14, 2001

Leadership Program
Boulder, CO
June 17–21, 2001

Participants come from a wide variety of backgrounds: those new to information resources management, those ready to move up to the next level of management, and those interested in exploring the ways in which information resources can be better managed to support the overall institutional mission.

Members of the EDUCAUSE Institute faculty are senior working professionals with years of experience managing information resources in higher education.
1. select, sequence, and supplement the “published” expression of content that is typically developed and copyrighted by scholarly authors or publishers;

2. facilitate discussions and other group activities to encourage collaboration, active learning;

3. guide students’ self-study—through class notes and even more extensive reading materials published on the Web. But the experience of reading materials published on the Web, and doing so is often considered as the electronic equivalent of authoring and publishing a textbook. "The IMS standards are evolving to create a cost-justifying, large open market for well-designed, highly interactive e-learningware for the higher education market. Only when this happens, will virtual learning materials be on a par with virtual discussion, virtual tests, and virtual reference resources in terms of their efficacy. Even then, traditional campuses, whether operating in their traditional nonprofit modalities or, as through new for-profit subsidiaries, will find it difficult to pull together the creative teams, business teams, and investments required to create successful learningware unless they do so in the Coase framework—with experienced partners in joint-venture relationships. But experienced partners are likely to continue to separate the value of the individual subject-matter expert from the value of his or her institutional employer except possibly in the case of "star" professors and their brand-name employers. In any case, engaging and supporting faculty in the development of learningware will be a very selective and expensive proposition. And traditional campuses should learn to differentiate their potential role in the development of commercially viable e-learningware from their role in the development of virtual credential-conferring curricula oriented to their market(s).\n
The Role of the Instructor in Learning

Current pedagogy and materials for sale externally. A few instructors succeed today as textbook authors, and a few eventually may succeed as authors of learningware, probably by working outside their institutions with companies to develop learningware, even to develop Web-native e-learningware. But commercial viability awaits a few more years of successful work by the nonprofit Instructional Management Systems (IMS) Global Learning Consortium Inc., which is facilitating the development and promotion of de facto standards for the “Internet architecture for learning.” The IMS standards are evolving to create a cost-justifying, large open market for well-designed, highly interactive e-learningware for the higher education market. Only when this happens, will virtual learning materials be on a par with virtual discussion, virtual tests, and virtual reference resources in terms of their efficacy. Even then, traditional campuses, whether operating in their traditional nonprofit modalities or, as through new for-profit subsidiaries, will find it difficult to pull together the creative teams, business teams, and investments required to create successful learningware unless they do so in the Coase framework—with experienced partners in joint-venture relationships. But experienced partners are likely to continue to separate the value of the individual subject-matter expert from the value of his or her institutional employer except possibly in the case of "star" professors and their brand-name employers. In any case, engaging and supporting faculty in the development of learningware will be a very selective and expensive proposition. And traditional campuses should learn to differentiate their potential role in the development of commercially viable e-learningware from their role in the development of virtual credential-conferring curricula oriented to their market(s).\n
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Any enterprise strategy should differentiate the two purposes of higher education: education as a social good and education as a market good.

boundaries and even for colleges and universities to partner with other institutions and companies for virtual operations and services.

Any enterprise strategy should also differentiate the two purposes of higher education: education as a social good and education as a market good. The latter is sufficiently different from the need for broad-based faculty development to drive learning in the interest of education as a social good.

Yet many institutions are attempting to address both needs with a common sup-

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Note 1. M. D. Goldstein explains these for profit possibilities in “Capital Ideas,” in Capital Ideas: Managing Information Resources on Campus (McKinney, Tex.: Academic Computing Publica-


Note 4. The IMS Global Learning Consortium is described in “Capital Ideas,” in Capital Ideas: Managing Information Resources on Campus (McKinney, Tex.: Academic Computing Publica-

Note 5. The planning of this idea is learned from Patricia Burton, “New Ways of Thinking about Private Financial Services,” in I. L. Dunkleman, ed., Organizing Management Information Resource Centers (McKinney, Tex.: Academic Computing Publica-

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