Preparing for Virtual Commerce in Higher Learning

by Donald M. Norris and Mark A. Olson

Virtual commerce in higher learning involves the online development and management of, participation in, and payment for learning activities by postsecondary learners. Virtual commerce in higher learning will figure to be an important component of the 21st-century learning environment. Today, most colleges and universities are not yet developing the core competencies and pilot projects necessary to engage in virtual commerce. We believe the time is ripe for such initiatives. Waiting for tomorrow may be too late.

Virtual commerce is key to Knowledge Age learning

In Transforming Higher Education, Norris and Dolence portray how colleges and universities are investing in information technology (IT) infrastructure and applications to prepare for the teaching and learning environment of the Knowledge Age. But on many campuses, virtual commerce in higher learning is hardly on the radar screen. The reasons are threefold. First, many leaders are focusing on more basic infrastructure and applications. Second, some leaders are waiting for new technology tools and the resolution of key legal and practical issues regarding intellectual property. Third, most leaders do not yet comprehend the importance of virtual commerce.

This is not surprising. Many educational leaders are still charting a path to the future guided by extrapolations of the past. They are digitizing existing structures and processes for academic delivery to provide virtual versions of today’s courses and degrees. To prepare for the learning environment of the Knowledge Age, leaders must prepare for a very different world than exists today. A world involving legions of learners from ages twenty-two to eighty-two. A world in which the metaphor of “educational delivery” is superseded by the metaphor of “interactivity.” A world in which traditional, on-campus learning will remain popular with some learners, but in which new modes of learning will arise to supplement and change even our traditional learning enterprises.

Tomorrow’s learning environment will contain many choices: (1) traditional learning, experienced on campus, augmented by technology; (2) new forms of technology-based distance and virtual learning that are variations on today’s themes; and (3) truly transformed learning, strongly technology-based, that can occur any place and any time. Virtual commerce will be central to all of these 21st-century learning scenarios. The 21st-century learning enterprise will provide learners with the capability to engage in learning any time and any place and to pay for intellectual property and academic support services online.

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intellectual property and academic support services online. Front-end, lump-sum payment for some types of learning and support services will be supplemented by per-use, point-of-sale payment for everything from merchandise to coursework to information to intellectual property to services of all kinds.

Virtual commerce will be critical to delivering distributed learning beyond campus boundaries. It will be essential to customizing learning experiences to fit the needs of every individual. And virtual commerce will be fundamental to pay-as-you-go approaches to technology-supported learning that will create new revenue sources. These will be necessary to raise new pools of revenue for enhancing IT infrastructure and applications.

Campuses must begin today to build the core competencies necessary for virtual commerce. Without these competencies, our institutions will not be able to take advantage of opportunities as they emerge. Yet to develop these competencies, we need to comprehend the look and feel of learning in the Knowledge Age. This requires that we look beyond today’s leading edge to foretell the true nature of learning in the 21st century.

Overcoming the misleading leading edge of the Knowledge Age

It’s the same in every field of endeavor, including education. We approach the future by digitizing our existing enterprise. In higher education’s case, this is the existing teaching franchise. We place a silicon veneer atop the organizational culture and existing courses and degrees, making them more efficient or accessible. We incrementally advance the existing franchise, unchallenged by a truly new vision. Then we puzzle why the new tools yield only marginal improvements.

The new tools of the Knowledge Age are presented to us incrementally. Most IT-based advances are crafted in increments upon existing tools. As Arno Penzias points out in his book, Digital Harmony, this leads to a condition where our sense of the current limitations of technology clouds our comprehension of its ultimate potential to create new ways of working, learning, and being.  

This is the misleading leading edge of technology that masks our appreciation of the potential of the Knowledge Age. But we must look beyond this misleading leading edge to see how work and learning in the Knowledge Age will be on a different plane than the one on which we are currently functioning. Penzias refers to this as the “Age of Coherence” or “Digital Harmony.” It will become known as the “Age of Learners.” An “atmosphere” of perpetual learning will be everywhere.

Our challenge is to develop visions of what the future of learning in the Knowledge Age will mean, and then to pull these visions to the present to understand the competencies we must develop to take advantage of these new opportunities as they emerge. We call this “making the blue sky meet the road.” Without these visions, deploying technology is like trying to push a rope uphill.

Creating assured migration paths to the future

Planning for the Knowledge Age is like trying to climb a mountain whose crest is shrouded in mist. As we move higher, the mist rises, revealing new opportunities. The challenge is to move upward, guided by visions of what lies ahead, yet uncertain of the specific final destination.

There is not just one plausible future, nor one path to the future. The challenge of planning for the Knowledge Age is to prepare learning enterprises for success in any of a number of plausible futures. This requires the creation of assured migration paths from the present to the different plane of operation that will ultimately be possible in the Knowledge Age. These migration paths should prepare colleges and universities to be successful in a variety of plausible futures.

The creation of assured migration paths consists of several steps:

- crafting shared visions of the future of learning;
- ripping those visions back to the present to identify barriers to be overcome, competencies to be developed, and resources to be marshaled; and
- launching incremental projects that build competencies and create assured migration paths to the future.

This is “expeditionary” development of new learning products and experiences. It views these new products as “rapid prototypes” that must be continuously changed and improved to move the institution up the mountain toward the future. We learn as we go, changing the rapid prototypes to reflect our emerging understanding and changing conditions.

Developing core competencies for virtual commerce

So what are the core competencies that are necessary for virtual commerce? And how do we develop them in a manner to create assured migration paths to the future?

First, let us understand that successful virtual commerce will involve much more than digital cash, smart cards, and online accounts, although...
competency in these tools will be critical. The core competencies for virtual commerce involve the whole range of processes, infrastructures, skills, and perspectives necessary to execute online commerce. These include competencies in developing the new products and services that will be delivered via virtual commerce channels.

Campus planning and change processes

To address the opportunities of the Knowledge Age, campus planning must be revitalized to be inclusive, inventive, inquisitive, and iconoclastic. It must question the prevailing assumptions of the higher education industry. Put simply, campuses must put the strategy back in strategic planning.

To support the development of virtual commerce, campus planning processes must understand the patterns and cadences of Knowledge Age learning. Successful campuses will foster campuswide dialogues on transformation and change. They will redirect existing processes—facilities master planning, budgeting, program review, and others—toward transformative ends. They will find ways to create new organizational cultures—both academic and administrative—and to share this new, organizational DNA with existing cultures in order to change them over time.

Achieving a higher level of competency in campus planning and change processes will enhance the success of virtual commerce initiatives.

Campus IT infrastructure

Most campuses are developing the basic network and enabling applications infrastructure that is essential for virtual commerce. In addition, they will need the next generation of software applications. These applications will fuse academic/administrative functions, provide much more extensive capabilities for learning management, utilize Web-based components, and depend on industrial-strength database engines. These new systems will be key to powerful new capabilities for learning interactivity, management, and assessment that will be essential to virtual learning.

The payment component of virtual commerce will depend on a combination of technologies. Powerful, smart-card-facilitated applications will be a cornerstone of the virtual commerce system. Smart-card systems will evolve from the current generation of access, security, and auxiliary-enterprise-driven tools to include the support of major academic functions. In addition, campuses will need to develop competencies in the integration of a variety of mechanisms for online payment—smart cards, digital cash, and other means of payment and accounting for transactions.

Campuses should be building the integrated network and applications infrastructures necessary to support the technology of virtual commerce. Moreover, they should be building expertise in pay-for-service, smart-card applications, digital cash, and other basic technologies. While initial projects on each campus are relatively primitive, they should be driven by a vision of where these applications are heading and build complexity over time.

New learning and interactivity models

The successful Knowledge Age campus will foster widespread experimentation and innovation with new learning tools. Interactivity will replace educational delivery as a driving metaphor. This spirit will be necessary to create the learning experiences and products that will be paid for via virtual commerce.

These new learning tools will include learning management tools that can be “mass customized” to fit the needs of any individual learners. And academic software that may enjoy national, international, or even global success. Network-centric scholarship will prevail for all levels of scholarship—discovery research, synthesis, teaching, and improvement of practice.

New generations of interactivity tools will enable group- and individual-based collaborations that will be a key part of online communities of reflective practitioners. Payment for participation in these “collaboratories” will involve both lump-sum payments and pay-for-value transactions, most of them virtual.

Learning agents are being developed today in colleges and universities, commercial online ventures, and other settings. These will emerge as integral tools in the future atmosphere of virtual commerce. Institutions should be deploying these tools, as they become commercially viable, in expeditionary projects to develop competencies in their applications.

New financial paradigms

Higher learning needs a new financial paradigm for IT—one that recognizes IT as an investment, not a capital expenditure, and identifies new sources of revenues. These new revenue sources should include a combination of philanthropy, grants, and contracts; partnerships with other schools and institutions; pay-for-service models; new products and services; and new markets for variations on existing products and services.

Pay-for-service is a key ingredient in this mix

3 The nature of such planning is described by Donald M. Norris in “Perpetual Learning as a Revolutionary Creation,” On the Horizon, November/December 1996.
of new resources, and virtual commerce is central to pay-for-service, both on and off campus. Campus leadership must comprehend this vision, and the salience of virtual commerce to its realization.

Customer-oriented focus, one-stop or no-stop shopping

In order to develop the capacity to provide interactivity, learning, and assessment that are mass customized to the needs of individual learners, colleges and universities must develop the capacity to be customer-focused. They must also develop the capacity for one-stop shopping for student and academic support services—or even no-stop shopping, where learners can navigate through processes without having to make physical visits to academic support and administrative offices.

Campuses should recognize the importance of these competencies to the world of virtual commerce in higher learning. They should launch initiatives to develop these competencies using existing academic models, in preparation for the new learning experiences of the Knowledge Age.

Supercharged strategic alliances

To reap the opportunities arising from Knowledge-Age learning, colleges and universities will need to forge powerful new alliances with other colleges and universities, new learning intermediaries, technology and entertainment companies, commercial learning agent enterprises, professional associations, and other organizations. These partnerships and strategic alliances need to take several directions.

First, these alliances will be critical in the development of learning, interactivity, and assessment tools. Colleges and universities do not have the capabilities, working alone or even as the primary driver, to create the new generation of learningware for the Knowledge Age. If they do not form alliances, they risk being bypassed by other providers.

Second, institutions should practice aggressive outsourcing that surgically separates out functions that can be better performed by outsourcing providers. These relationships are more like co-sourcing or re-sourcing than our traditional concept of outsourcing. Such resourcing alliances exemplify a new variety of partnerships that will be key to virtual commerce.

Third, colleges and universities must reach a more reflective understanding of the new skills required for virtual commerce in higher education, and of how their own skills sets need to be complemented—dramatically.

Colleges and universities need to launch initiatives and expeditionary projects, today, to develop these core competencies for tomorrow.

Preparing today to develop tomorrow’s competencies

The following initiatives are exemplary of today’s projects that can build tomorrow’s competencies for virtual commerce.

Web-based administrative applications

This past fall, Indiana University, with the University of Delaware and University of Minnesota co-hosting, sponsored the first annual Webdev Conference, dedicated to the development and sharing of information on Web-based administrative applications. Over 300 individuals from over 200 schools attended this sold-out conference, and attendees explored dozens of initiatives that will form the core of virtual commerce in the future. Examples explored included admissions application processing, course registration, student bill payment, academic advisement, financial aid processing, and others—every administrative application conceivable can be considered for virtual commerce delivery. What will be required to truly transform our delivery mechanisms will be entirely new visions of disintermediated student services delivery, the “no-stop” shopping approach, where students will be empowered to act as their own agents in these business transactions with colleges and universities. The barriers to change will not be technological but political, legal, and organizational.

Large-scale learningware projects

The model of having thousands of faculty develop digital learningware has created many useful innovations. It has not, however, created scalable, new-paradigm-based learningware that can really meet the demands of cross-institutional and even global markets. The National Learning Infrastructure Initiative (NLII) detailed this dilemma in Academic Productivity: The Case for Instructional Software. NLII is seeking to form a coalition of partners to develop a new generation of academic learningware that is both globally scalable and mass customizable.

Digital signature standards

As of this writing, only the states of California and Utah have passed state legislation supporting digital signature standards, though our federal government is moving towards an electronic delivery mechanism for several of its key transactions with public agencies. Today, we cannot enforce a legal contract, say a loan application, if

“...required to truly transform our delivery mechanisms will be entirely new visions of disintermediated student services delivery... where students will be empowered to act as their own agents in these business transactions with colleges and universities.”

4 A second conference, WebdevShare97, will be held October 19-21 in Bloomington, Indiana, in cooperation with CAUSE. For details, see http://webdev.indiana.edu/WebdevShare97/

the state involved does not have a law in place to enforce the legality of the contract. Legislative reform can be driven by the post-secondary educational institutions, and it must start there today, so that tomorrow we might unleash the power of virtual commerce.

**Information access and privacy**

In a similar area, the Family Education Rights and Privacy Act (FERPA) of 1974, or the Buckley Amendment as it is often known, has not been reviewed in the light of the extraordinary advances in Web-based commerce, or Internet transaction processing. How does the current meaning of “directory information” apply to the world of the Web? Several key political action groups are engaging in important discussions about privacy rights and public information law, and it is our opinion that higher education must join in this discussion, pushing the legislative and political direction to prepare the grounds for true virtual commerce.

**Electronic Data Interchange**

Electronic Data Interchange (EDI) has had a most disappointing beginning in higher education, principally exhibited in the limited deployment of the SPEEDE transcript delivery system. While commercial and corporate enterprises have embraced EDI, and the federal government will be mandating its use in the near future, higher education has been reluctant to fully embrace this technology.

It almost seems as though in coming to terms with standards and agreed-upon transaction sets, institutional identity might be at risk. It is less the technology of EDI, we believe, than the conservative and risk-averse nature of our institutions to embrace change that has held up an initiative that will greatly reduce our operating costs, speed up important information exchange, and free up staff for important “knowledge work” instead of clerical transaction processing. It is up to the campus leadership to move the organizations to change.

**Pulp fiction/pulp futures**

Another key initiative that requires attention today for tomorrow’s world of virtual commerce is the area of electronic publishing and scholarship. Higher education must take a leadership role on this topic immediately. Its leaders should embrace everything from systems and mechanisms for protecting intellectual property rights, to distribution networks for publishing and distributing scholarship and scholarly texts, to means of metering intellectual property and value-added services.

Several publishers are already working with academic administrators, faculty, and bookstore professionals to lay the groundwork for electronic delivery systems. Librarians and information systems professionals are at work building the infrastructure for the virtual library of the future. Content delivery, both from a curriculum perspective and a research dimension, has already begun to be provided through electronic media. But these initiatives are in their infancy, and campus leadership must weigh in to participate in the design and development of this virtual commerce initiative. On campus, partnerships between the bookstore, libraries, and academic professionals will be needed to advance virtual commerce involving intellectual property.

**Onward to cyber cash**

While several colleges and universities are now moving towards the acceptance of credit-card transactions through interactive voice response (IVR) systems, and more are accepting new ACH-based electronic funds transfer transactions for payment, loan disbursement, and loan payments, few are supporting digital cash, or “cyber cash” systems. While smart-card technologies are just in their initial deployment, we will indeed begin to see rapid deployment of electronic-wallet technologies for Web-based commerce and for in-person payments. The VISA pilot at the Atlanta Olympics, while not seen as a grand success by many, indicated the industry direction, and soon pilots in New York and other regions will see the VISA and Master Card deployment of smart-card systems. Colleges and universities could well take advantage of their unique position, their ideal campus environment, for smart-card development and deployment, enabling both Web-based commerce and local merchant transactions.

**Conclusion**

These are but a few of the initiatives that some campuses are participating in today, and we feel that these and others are critical opportunities to develop tomorrow’s core competencies in virtual commerce. There are others, but these are here today, and the campus leaders who move their institutions towards participation in these and other like initiatives will enable those institutions to truly inform and shape the delivery systems, the legal and political changes necessary, and the organizational transformation necessary to prepare for the 21st century.