



By Carole A. Barone

THE CHANGING LANDSCAPE AND THE NEW ACADEMY

Leveraging information technology is about anticipation. In 1994, few other than the founders of the National Learning Infrastructure Initiative (NLII)—Carol Twigg and Robert Heterick—and NLII Planning Committee Chair William Graves had the vision to anticipate the teaching and learning landscape that would evolve. Although some may chafe at the use of the term *evolve* in relation to the change that has occurred, the fact remains that nearly a decade has elapsed since Carol Twigg's first descriptions of the power of technology to transform teaching and learning were published in a three-part series in *Educom Review*.¹ Those seminal articles provided the rationale for the founding of the EDUCAUSE (then Educom) NLII.

Founded on Conviction

The NLII (<http://www.educause.edu/nlii>) was founded on the conviction that information technology has the power to

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transform teaching and learning. During its early years, the NLII focused its largely evangelical efforts on educating members of the academy about the enabling power of technology and persuading them to invest in the infrastructure required to foster the expected widespread adoption of new methods of instruction. In anticipation of the transformation that needed to occur, the founders of the NLII argued that the initiative required collaboration among higher education, government, and the commercial sector to execute such a massive change in vision, values, policy, and economics. In about the year 2000, as awareness of active, learner-centered practice as the target began to grow, the NLII shifted its focus from evangelizing about the power of technology to elucidating the interplay of technology, pedagogy, and behavior within the academy.

Much has indeed changed, yet much remains the same. In many respects, this quotation from the third article in Twigg's 1994 series still applies: "Our current system of higher education—developed to serve a different student population from the one we now have—is cracking under the strain of meeting new learning demands. The system is based on old as-

sumptions about teaching and learning and on old technologies that have outlived their usefulness. . . . Higher education's administrators have spent the most recent period in our collective history allocating shortages. Without creative approaches to the cost/quality/access nexus, our colleges and universities will continue to flounder."²

However, there is a growing body of evidence that the envisioned transformation has finally begun to occur and that

Nine Patterns in the Changing Landscape

1. Learning and teaching have changed, as has cognition.
2. The course is not the container; teaching "space" is not a physical place; and "personal" does not mean "in person."
3. Community matters.
4. Standards enable.
5. Technology decisions are teaching and learning decisions.
6. Support services need to be scalable, sustainable, and grounded in principle.
7. Assessment does not have to be arbitrary and artificial.
8. Collaboration is happening.
9. Higher education can change.

the momentum is irreversible. Early efforts, by a small number of faculty pioneers and entrepreneurs working with technologists, to exploit the enabling power of information technology were generally piecemeal and iterative. Such changes, insinuated into the existing context under the political radar, were occasionally significant but seldom systemic. The cumulative effect of this stealth work, along with students whose cognition was formed in the digital age, is beginning to have a noticeable impact on the topology of the teaching and learning landscape. The findings of NLII studies and Focus Sessions have identified nine patterns that reveal the changing landscape.

Patterns in the Changing Landscape

1. Learning and teaching have changed, as has cognition.

A growing number of today's students, whose cognition was formed in the digital age, take access to the Internet for granted; access is simply an essential aspect of daily life. These students display an "Information-Age Mindset": they expect to try things rather than hear about things; and they tend to learn visually and socially. Today's students are accustomed to using technology to organize and integrate knowledge. These students are polite, but also bewildered at first, later disappointed, and often finally disillusioned and dispirited by passive learning experiences.³

The Information-Age Mindset

In an *EDUCAUSE Review* article, Jason Frand listed ten attributes of the "information-age mindset" of today's students:

- Computers aren't technology.
- The Internet is better than TV.
- Reality is no longer real.
- Doing is more important than knowing.
- Learning resembles Nintendo more than logic.
- Multitasking is a way of life.
- Typing is preferred to handwriting.
- Staying connected is essential.
- There is zero tolerance for delays.
- Consumer and creator are blurring.

Source: Jason L. Frand, "The Information-Age Mindset: Changes in Students and Implications for Higher Education," *EDUCAUSE Review* 35, no. 5 (September/October 2000): 14–24.

Technology enables the design of learning situations that actively engage and guide the learner while allowing the learner to choose the style of the learning experience and to organize the knowledge outcomes. Conceptualization of the learning environment is transitioning from learning in a physical space—that is, the classroom—to a student-centered learning environment situated in cyberspace. Deeper learning is the goal of such active, learner-centered practice, involving the interplay of technology and pedagogy. NLII 2002 Fellow Colleen Carmean, of Arizona State University–West, has mapped the learning space, based on learner-centered principles, to show how technology promotes deeper learning (<http://www.educause.edu/nlii/keythemes/lcp>).

Electronic portfolios are a tangible and pragmatic reflection of the new landscape. E-portfolios are moving quickly into the mainstream of higher education because they provide a recording, sorting, and reporting mechanism to support student-enrollment patterns that ignore institutional boundaries. By offering students the means to identify gaps in their learning outcomes and to demonstrate competencies that are important to their professional advancement, e-portfolios also enable students to organize and control their learning and to demonstrate the outcomes.

2. The course is not the container; teaching "space" is not a physical place, and "personal" does not mean "in person."

For most students, including those in traditional residential campus settings, formal education takes place within an intellectual and social context created and sustained by technology. These students often arrive on campus with expectations that conflict with their cognition. They expect the traditional classroom learning situation, but they also need the stimulation, the ability to socially construct knowledge, and the immediate feedback enabled by the network.

Despite their traditional expectations, today's students perceive their learning environments as boundless. They tend to use physical space differently than did prior generations, and they blur the boundaries between physical and cyberspace and between mine, yours, ours, and everyone's. This has immediate implica-

tions for campus architectural design and for all aspects of student services, not to mention for policies related to the definition of a course and to how learning is assessed and ownership determined.

Because students expect to control when, where, how, and how fast they learn, they are motivating faculty to change their modalities of instruction and interaction. For example, to students who grew up in a digital world, "personal" means getting the attention of the faculty member—whether that is online, on the student's cell phone, or in person—when the student needs it, not when the faculty member has office hours or comes to the classroom.

Bryan Alexander, of Middlebury College, evokes a troubling image of the near-term future as mobile (wireless) learning, or "m-learning," begins to take hold on campus: "M-learning shifts the educational center of gravity towards students, raising fundamental and practical questions about learning for every instructor and campus. . . . Students arrive on campus bringing an increasing number of years spent using cell phones and texting to coordinate their lives. A new generation gap opens between teacher and student along an increasingly different set of expectations about space, time, and social mores."⁴

3. Community matters.

Students take the Internet for granted as their access to community. They naturally form their own learning communities because this is the way they test and process knowledge, and indeed, this is one way (though it should not be the only way) they learn discrimination and taste in the selection of Web-based sources. Faculty and professional staff are increasingly using community-building tools to create communities to foster the exchange of ideas, to address difficult problems, and to avoid intellectual or professional isolation. *EDUCAUSE*, for example, is piloting a series of such communities (<http://www.educause.edu/vcop>).⁵

Course management systems include community-building tools as a pedagogical feature to engage students in group work that promotes student ownership of the learning environment and facilitates personal contact among students within

the learning community. Descriptions of this and other requirements of next-generation course management systems appear in the proceedings of the March 2003 NLII Focus Session (<http://www.educause.edu/nlii/meetings/nlii032>).

4. *Standards enable.*

Sometimes faculty misconstrue efforts to establish standards for software and hardware interoperability as being technically motivated constraints on individual pedagogy. However, standards efforts, such as the IMS Global Learning Consortium (<http://www.imsglobal.org>), have been motivated by the conviction that technical interoperability would be the crucial enabler of the transformation of teaching and learning.

Faculty members who are accustomed to using course management systems and learning objects to develop active, learner-centered pedagogy are now demanding greater freedom and flexibility in working with learning materials—that is, they want it to be easy to share learning objects and to take their work with them when they move to another institution. They want to be able to collaborate with others for curriculum development, across courses and across institutions.

Standards generally flow from practice. Interoperability is necessary to make the new pedagogy affordable, supportable, portable, and robust. Standards for interoperability provide a subtle but profound illustration of the pedagogical implications of technological choices. It is important to find ways to involve more teaching and learning practitioners and theorists in the efforts to develop standards and technical specifications.

5. *Technology decisions are teaching and learning decisions.*

There is growing recognition that decisions about technology on a campus are ultimately academic decisions and have an impact on valued and respected campus practices, interactions, and conventions. The consideration of technology in isolation from other campus variables leads to unrealistic expectations and simplistic answers to extremely complex challenges, involving multiple interrelationships among issues, governance conventions, and key players. Key campus

decision-makers need to be sufficiently comfortable with technology to understand the implications and trade-offs in terms of overall institutional strategy and to share ownership of the outcomes of technical decisions.⁶

Concerns about the real or imagined power of the technology to distort priorities and to alter relationships within the academy will be ameliorated only when academicians and technicians are able to communicate their mutual objectives. Standards offer an interesting example of successful communication.

6. *Support services need to be scalable, sustainable, and grounded in principle.*

Traditional support services, based on furnishing help to individual faculty members, are not scalable and sustainable when the majority of faculty seek assistance in revising their pedagogy. Under such circumstances, campuses must embrace support tools, processes, and organizational structures that eschew the norm of individuality while at the same time honoring the faculty member's judgment in guiding the learning process.

In addition to creating new organizational collaborations to leverage resources, some higher education institutions are implementing online support systems, many of which are embedded in the campus learning management system. The University of Arizona, for example, has designed and is in the process of implementing a knowledge-based system built around learning principles to provide online support to individual faculty members. "The Module Organizer And Teaching System (MOATS) provides guidance in developing . . . learner-centered practices across a variety of instructional technologies."⁷ Instead of teaching faculty how to use technological features, MOATS focuses on the learning problem the faculty member wants to address and then provides templates and uses case examples of how to employ the technology in accordance with the learning principle.⁸

The manner in which support is built

into learning management systems influences the choices that faculty members perceive and make in developing their pedagogy. This is another example of the importance of finding ways for faculty and technologists to collaborate productively in the development of technical specifications.

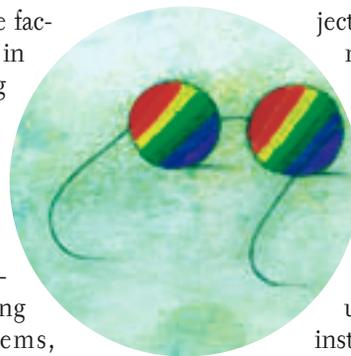
7. *Assessment does not have to be arbitrary and artificial.*

Assessment can be internally motivated and aligned at the same time that it contributes to the development of a constructive response to demands for accountability and assessment from accreditation agencies, legislative bodies, funding agencies, and others. The NLII began the three-year Transformative Assessment Project in January 2002 (<http://www.educause.edu/nlii/keythemes/transformative.asp>).

The term *transformative assessment* introduces measures of progress toward goals to identify the next steps needed to continue on the transformation trajectory. Transformative assessment strategies are integrated throughout the institution at all levels and are designed to provide insight into learning, learning processes, and learning outcomes. Such an aggressive and directed use of assessment requires institutional commitment and alignment.

Those who are closely associated with this work believe that transformative assessment could play the same role that technology has performed in transforming teaching and learning. Assessment of learning outcomes requires reflection about practice, the result of which could make possible many things that were never before possible.

The fact that transformative assessment is being discussed, and even attempted, on some campuses is a sign that higher education is changing. The Student Learning Objectives (SLO) system at the University of Washington (<http://www.washington.edu/slo>) is an example of a response to accrediting associations' and legislators' demands that colleges and universities report on learning



outcomes. It is also an illustration of how quickly and thoroughly a major university can change under the guidance of sensitive leadership.

8. Collaboration is happening.

From the outset, the NLII put a great deal of effort into working with its higher education and commercial members to identify opportunities to collaborate. The IMS Global Learning Consortium was one of the few successful outcomes of those prodigious early efforts.

For years, the NLII has preached the benefits, indeed the imperative, of collaboration, yet with scant evidence of successful outcomes. The commercial sector, wary of rivals gaining advantage, fiercely protected any perceived competitive advantage by thwarting attempts to persuade them to collaborate with each other. Higher education institutions, with their deeply embedded culture of independence, did not (and many still cannot) find an advantage in collaboration. But suddenly, over the past eighteen months, various innovative and robust collaborations have burst on the scene. Those with the courage to flaunt convention have found the formation of coalitions, consortia, and other collaborations on and off campus to be a successful strategy for accomplishing more than would be possible by acting independently.

There is a growing recognition of the importance of consortia in supporting and facilitating technical change. Thus, we have seen the unexpected success of MERLOT (Multimedia Educational Resource for Learning and Online Teaching) in the learning objects arena (<http://www.merlot.org>), numerous interesting electronic portfolio consortia, the Open Knowledge Initiative (OKI) involving higher education and the commercial sector (<http://web.mit.edu/oki/>), and an astonishing series of collaborations among land-grant universities. Perhaps the motivation for such arrangements was self-defense as some in higher education realized that costs would continue to escalate for external, commercial solutions if they did not find a way to partner

and thus move forward on more favorable terms.

Higher education and the commercial sector also appear to be finding ways to work together in more realistic and sensible arrangements. In its relationships with the commercial sector, higher education has operated under the handicap of failing to recognize that with effective collaboration comes the authority of consensus. One reason higher education has been relatively ineffective in getting its needs met by software developers is its relentless inability to provide a consensual priority list of requirements. The March 2003 NLII Focus Session, "Course Management Systems: Next Generation," was designed to address this issue. Discussions among course management system vendors and higher education representatives at that focus session reflected a mutual respect for and understanding of their respective motivations and constraints and did produce a priority list of requirements for next-generation course management systems.⁹

9. Higher education can change.

Higher education has enjoyed a long period of prestige and self-governance largely unfettered by external interference and accompanied by a relatively lavish and uninterrupted infusion of funds. Thus, there was little internal or external motivation to change. Although many colleges and universities continue to choose to operate with fiscal optimism, it remains to be seen if funding will return to previous levels, as it has in past retrenchment cycles.

In the meantime, some college and university leaders have come to the realization that accountability and collaboration are realistic expectations on the part of those who provide the resources. The SLO system at the University of Washington is a remarkable example of internal alignment and institutional will. The university declared a set of institution-wide learning objectives for its students, and departments and courses have mapped their respective learning objectives to the

university-wide set. SLO has defined learning objectives for virtually all of the institution's 6,000 undergraduate courses and sections.

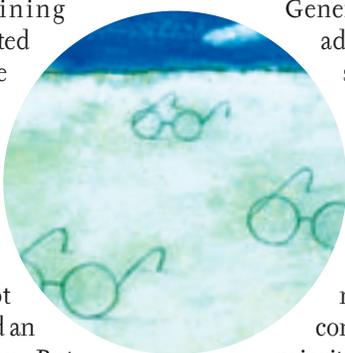
In a plenary address at the 2003 NLII annual meeting, Debra Friedman, associate provost for academic programs, described how SLO, combined with an e-portfolio, gives students tools to manage their learning and will motivate and enable them to select courses based on objectives and then to judge whether the course met those objectives. Moreover, "SLO is a metric that changes as the goals change," said Friedman. "And it allows faculty to measure what they think is happening with what is really happening. It is designed to honor professors' teaching identities and disciplinary differences while summing meaningfully across diverse units of the University."¹⁰ In other words, SLO sums to university-wide learning objectives.

Although the size, affiliation (e.g., public, private, church), and type (e.g., research, land-grant, liberal arts) of institution may influence the speed or extent of actions taken, NLII findings indicate that the issues persist across all institutional categories and sizes. When it comes to the role of technology in teaching and learning, the deeply held conviction that certain colleges and universities are uniquely special—and that, as a consequence, recommended practices do not apply to them—is based on a myth. This myth continues to provide a convenient excuse for not changing; it also tends to blind decision-makers to the exemplary and often adaptable practices that already exist.

The bold and courageous step taken by the University of Washington SLO project exemplifies a type of systemic change that higher education institutions need to effect. Few campuses will evade the task of addressing these changes in teaching and learning. The longer a campus waits, the more difficult it will be to find and deploy the required resources and the more often cataclysmic episodes will occur when the upheaval becomes inevitable.

The New Academy

Technology has permeated the academy to such an extent that institutional behavior occurs within a sociotechnological



context, fundamentally altering the dynamics of a campus. The implication is that changing at the margins is no longer possible because of the interplay of technology, pedagogy, and behavior.

Recently, the NLII has begun to describe the outcomes of this interplay as the creation of the “New Academy.” The change that leads to the emergence of a New Academy is not linear, nor is it iterative. More transformational in nature, like an earthquake, it is shocking, complex, disruptive, and confusing. This is the type of systemic disruption that causes some to flee, others to fight to protect the *status quo* from unpreventable and seemingly unpredictable forces, and a foolish or courageous few to ride along for the thrill. It involves a complete new context—new structures and funding models, new professionals, new relationships, new accountability, and new leadership roles:

- *New structures and funding models.* Descriptions of the New Academy revolve largely around new learning en-

vironments. However, the New Academy also behaves differently. This new context demands more fluid, yet more responsive, organizational structures and conventions. Rigid funding models and budgetary practices inhibit the ability to thrive. The new context requires the alignment of planning and budgeting, with the leadership message surrounding teaching and learning priorities, at all levels throughout the institution.

- *New professionals.* New professional staff, such as learning designers, are becoming important and respected partners in transforming the campus teaching and learning environment. Similarly, knowledge-management professionals are entering the mix and are straddling the area between information resource management and student services (in terms of those tools that allow students to control and manage their learning).
- *New relationships.* The cultural norm of individualism is gradually giving way in the New Academy. New relation-

ships form in this new sphere of behavior both as a result of the introduction of new agents, such as knowledge-management professionals, and as a result of the volatile nature of the new context.

- *New accountability.* These days accountability carries numerous interpretations. Return on investment (ROI) is often mentioned in relation to determining the academic outcomes of resources directed to, and within, an institution.¹¹ For those committed to change, accountability and assessment take on another interpretation with the introduction of measures of progress toward goals to identify the next steps needed to continue on the transformation trajectory. Such an aggressive and directed use of assessment requires institutional commitment and alignment.
- *New leadership roles.* Leaders in the New Academy recognize that institutional forces operate within a multidimensional framework, creating a dynamic tension between vision and alignment.

Their challenge is to guide the alignment of institutional thinking in terms of its vision, the enabling role of technology, the revision of policies, and the allocation or reallocation of resources to remove barriers to the attainment of that vision, while at the same time being mindful of the institution's cherished values and unique culture.

This notion of alignment is of such consequence because the landscape of teaching and learning has changed so dramatically. The motivation to engage the digital-age learner is leading inex-

orably to the penetration of new, learner-centered practice. Although cultural, philosophical, and policy barriers to the transformational change envisioned by some remain, the upheaval has begun. Understanding the forces at work in creating the new teaching and learning landscape is essential to guiding them.

The New Academy is emerging. Those who know and understand the topology of the new landscape will feel comfortable navigating through it. *e*

Notes

A shorter version of this article was published as "Technology and the Changing Teaching and Learning Landscape," *AAHE Bulletin.com*, May 2003, <<http://www.aahebulletin.com/member/articles/educause.asp>>.

1. Carol A. Twigg: "The Changing Definition of Learning," *Educom Review* 29, no. 4 (July/August 1994); "The Need for a National Learning Infrastructure," *Educom Review* 29, no. 5 (September/October 1994); and "Navigating the Transition," *Educom Review* 29, no.6 (November/December 1994).
2. Twigg, "Navigating the Transition."
3. The theme of the NLII 2004 annual meeting in San Diego, January 25–27, 2004, will be new technologies and the new learner.
4. Bryan Alexander, "Teaching in the Wireless

Cloud," *TheFeature*, April 7, 2003, <<http://www.thefeature.com/index.jsp?url=article.jsp?pageid=35265>> (accessed June 18, 2003).

5. An interesting discussion of the intellectual malaise that seems to afflict many students trapped in traditional learning settings has been taking place in one of these communities—the new academy virtual community of practice (<http://www.educause.edu/vcop/newacademy>).
6. David Ward and Brian L. Hawkins, "Presidential Leadership for Information Technology," *EDUCAUSE Review* 38, no. 3 (May/June 2003): 36–47.
7. Wayne Brent and Jean Kreis, "Navigating Learning Theory for Instructional Technology Use" (presentation at the NLII annual meeting, New Orleans, January 27, 2003), <<http://www.educause.edu/asp/doclib/abstract.asp?ID=NLIO339>> (accessed July 1, 2003).
8. There is a mock-up of MOATS at <<http://moats.arizona.edu>>. The University of Arizona developers are looking for collaborators from other institutions of higher education to further this work.
9. See <http://www.educause.edu/asp/conf/meeting/proceedings_sessions.asp?meeting=nlII032&link=GS,SESS,NOTE> for information on this focus session.
10. Debra Friedman, "Student Learning Objectives (SLO) and the Transformation of the Learning Experience" (plenary session at the NLII annual meeting, New Orleans, January 27, 2003), <<http://www.educause.edu/asp/doclib/abstract.asp?ID=NLIO337>> (accessed July 1, 2003).
11. William H. Graves, "New Educational Wealth as a Return on Investment in Technology," *EDUCAUSE Review* 37, no. 4 (July/August 2002): 38–48.

Elements of Alignment in the New Academy

- Knowing the destination (vision and outcome)
- Understanding how to use the tools available (technologies and techniques)
- Having a map for how to get there (principles, plans, and policies)
- Paying attention to the whole environment and all the players (attending to the community, context, and roles)