The National Academies Press released a report, *Preparing for the Revolution: Information Technology and the Future of the Research University*, in late 2002. Among the most striking statements in the report is: "It is no great exaggeration to say that information technology is fundamentally changing the relationship between people and knowledge." While it is difficult to predict the effects of this changing relationship, it is certain that they will be widespread and deep—and not just for research universities. In the fall of 2001, the National Institute for Technology and Liberal Education (NITLE) was formed when presidents of more than 80 liberal arts colleges signed on to become affiliated with the institute and its regional technology centers. Clara Yu, College Professor at Middlebury College and director of NITLE, describes the institute’s mission and the metamorphosis of the liberal arts environment.

**National Institute for Technology and Liberal Education**

The National Institute for Technology and Liberal Education (NITLE) works with 81 national liberal arts colleges and three regional technology centers located in Vermont, Texas, and Michigan, that focus on the Mid-Atlantic and New England, Southern, and Midwestern colleges, respectively. NITLE’s explicit mission is to serve as a catalyst for innovation and collaboration for national liberal arts colleges as they seek to make effective use of technology to enhance teaching, learning, scholar-
ship, and information management. NITLE delivers a specific set of products and services that enables small residential colleges to eliminate redundancy, lower costs, and retain individual institutional competitive advantage, while at the same time benefitting from shared resources, procedures, and results of research and development efforts.

NITLE is the first national, large-scale, networked virtual organization in higher education. Its affiliated colleges share remarkably similar missions, curricular offerings, governance structures, and business processes. They can be regarded as a business sector with an annual combined operating budget exceeding $10 billion, yet none of these institutions could afford to mount its own research and development efforts. With the establishment of NITLE, research and development efforts have been launched to develop tools and technologies explicitly designed to enhance the teaching and scholarly activities in liberal arts colleges.

Since its founding in 2001 with support of The Andrew W. Mellon Foundation, NITLE and the regional centers have directly involved more than 2,500 administrators, faculty, information technologists, librarians, and student technologists in a wide variety of initiatives, including the following, among others:

- Presidential and executive briefings have been held in all three regions on topics including technology infrastructure, planning of new learning spaces, strategic alignment of the institutional mission with technology planning, and technology-enabled learning and teaching.
- National, regional, and interinstitutional programs have been mounted to provide professional development opportunities for faculty and staff, showcase effective practices, and share resources in emerging areas of curricular interest such as geographic information systems, new media, and bioinformatics.
- Research in advanced search algorithms has been conducted and a semantic search engine has been developed for automated organization of unstructured data. This engine may well serve to greatly facilitate research and scholarly communication.

Meanwhile, NITLE staff has also been observing changes in the behavior of its affiliated institutions, while keeping abreast of the changing world outside academe and its impact on academic communities. Since NITLE is an experiment itself, one of its functions is to document lessons learned, and share them with the higher education community.

The Changing Liberal Arts Environment

Liberal arts colleges first came into being in answer to local needs for preachers and teachers, and drew students from their own geographically defined communities. Today, increasingly, they recruit students and faculty on a national and international scale, broadening their sphere of influence and, in turn, becoming more culturally, socially, and economically diverse. Despite this broadening of their vistas, however, undergraduate residential colleges are limited by their on-site capacity; although an increasing number of colleges is experimenting with virtual offerings to alumni, this sector has stayed away from distance learning of any significant scale.

An April 2003 Business Week special report, “Colleges in Crisis,” cited rising costs, tuition hikes, the arms race, endowment erosion, and reduced public and private support as some of the challenges liberal arts institutions face today. The report spotlighted Williams College with a catchy title: “The elite get eliter.” At the time, according to the report, Williams had a $1.1 billion endowment, charged $38,000 per student, and expended $80,000 per student. Clearly, this is an expensive enterprise. The question at hand is whether this model can sustain itself in the face of market realities: Can small, residential, liberal arts colleges evolve smoothly to maintain excellence, contain costs, and expand their sphere of intellectual influence so that this sector not only survives, but thrives?

Our lives today are complex, hypermediated, fast moving, multisensory, and driven by devices that enable and encourage multitasking. We are asked to make decisions not only on issues of personal well-being, but on ethical and existential issues involving our global society and the human destiny — from the protection of the environment, to the clash of civilizations, to decisions about whether to
ban human cloning, to the contemplation of posthumanism. Today, the bar set for a “liberally educated” person is particularly high. Yet the educational institutions meant to “produce” such citizenry traditionally move at a slow speed in establishing new disciplines and new ways for learners to interact with knowledge.

How can we make education relevant and useful for the future citizens of such a world?

Making the transition from teacher-focused pedagogy (e.g., large lectures and faculty-directed seminars, discussions, labs, and so on) to learner-centered processes may provide an answer. Yet this conversion entails serious challenges, as it involves rethinking the respective roles of faculty and students, redesigning the curriculum and course content, and reimagining the physical and virtual environments in which learning activities take place.

NITLE’s experimental efforts to meet these challenges have produced some success stories that offer hope. Perhaps the most important observation is that traditionally typecast roles do appear to be changing for faculty, students, librarians, and information technology staff on our campuses. One college changed the curriculum of its entire foreign languages department to incorporate collaboration with students as technology consultants, and its proud chair has concluded, “Our department is transformed. The faculty is learning alongside the students. Our students and faculty are true partners!”

NITLE’s work has shown that a healthy combination of the “sage on stage,” the “guide on the side,” and self-managed learning on the part of the students seems to produce the best results. Indeed, the most encouraging sign to emerge from our work is how much students are willing to take charge of their own learning once they have been given the opportunity to do so.

These are subtle but important changes. The small size of liberal arts colleges not only enables these changes to happen, but allows them to have great impact on the institutions. On a 1,500-student campus, a series of small experiments and successes can change the ethos of the place.

As a result of changing roles and relationships in these small learning communities, the definition of “liberal learning” is shifting. The best liberal arts colleges today realize that individual institutions can’t do everything for everyone—yet institutions do want to give their students the opportunities they want and need in an environment that fosters interaction and open scholarly communication.

One of the ways for these colleges to provide such opportunities is through collaborative efforts facilitated by NITLE. Faculty, librarians, and students engaged in the exploration of Arab culture, Islam, and the Middle East, for example, can now interact across campuses and disciplines to broaden their vistas.

Equally important is the community, actual and virtual, on one campus and across campuses, that provides the environment in which students form ethical judgments, contemplate the meaning of truth and trust, forge lifelong friendships, and hone critical thinking skills. The combination of residential learning and today’s technologies seems to provide the best opportunity to achieve a contemporary definition of liberal learning.

Social Networks and a New Knowledge Ecology

A law on the power of the Internet asserted by Internet pioneer David Reed, and known as Reed’s Law, says that the Net’s value increases rapidly as the number of human groups using the network—not just the individual-to-individual connections—increases. We are clearly still at the early stages of comprehending, let alone harnessing, the power of networked communities, but we can be sure that new network architectures and tools will continue to facilitate and enhance group-forming processes and social network activities. Since the ultimate democratization is that of ideas and knowledge, it is vital for higher education to pay attention to the changing landscape of Net-enabled social networks and the activities pulsing through them.
One relatively new form of publication-cum-communication enabled by the Net is the Weblog—a “log on the Web,” the content of which is displayed in reverse chronological order, and reflects the personality and interests of its editor (though visitors may post comments). The editor posts frequent updates and typically provides links to referenced materials outside the site. Many “bloggers” create and participate in evolving and shifting communities of interest, through internal discussions and links to other Weblogs.

As part of its research and development effort, NITLE implemented a BlogCensus to tracks Weblogs. As of the fall of 2003, the census had indexed over 1.5 million blogs. Our primary reason for tracking blogs is to see if we can find validating evidence of Reed’s Law in the knowledge blogosphere. We wonder how future knowledge aggregation, analysis, creation, dissemination, and preservation will be done since knowledge on the Web seems to be embedded in social activities. Will the intellectual activities in higher education change as well, or will they remain centrally controlled by individual institutions and by professional associations? Will knowledge networks emerge that are based on Net-enabled social interaction among knowledge-creators and knowledge-seekers? Will these networks bear any relationship to educational institutions?

Conclusion

The future of education and educational institutions may well be redefined by the process of the democratization of knowledge, powered by emerging social networks enabled by information technology. In the liberal arts colleges sector, a networked virtual organization such as NITLE can assist institutions in navigating between an evolutionary process that’s too often burdened with structural inertia and a revolution in knowledge acquisition that is so disruptive that it marginalizes higher educational institutions as we know them today.

Clara Yu is the Cornelius V. Starr Professor of Linguistics at Middlebury College and director of the National Institute for Technology and Liberal Education, which she founded in 2001 with the support of The Andrew W. Mellon Foundation. Yu has served on a number of technology task forces and consulted for institutions world-wide. Prior to her work as a college professor and administrator, Yu was a consultant in artificial intelligence and knowledge engineering.