

The IT Leader as Alchemist

By Ron Bleed

Finding the True Gold

“Among modern occupations, only cult leaders and TV weathermen rival the technological visionary’s ability to retain credibility despite all evidence to the contrary.”

—Nathan Myhrwold

The information technology (IT) leader within higher education can be viewed from three scenarios: (1) the IT leader as plumber; (2) the IT leader as gardener; and (3) the IT leader as alchemist.¹ In the first scenario, the college or university network consists of pipes, and the role of the IT leader resembles that of a plumber, who keeps the pipes connected and flowing. The IT leader must build and maintain the infrastructure. In the second scenario, the role of the IT leader is like that of a gardener. As Polley McClure wrote in *Organizing and Managing Information Resources on Your Campus*: “IT management is akin to planting seeds of ideas and waiting to see if any will germinate. If they do, we scurry around to find water and nutrients, and we try to keep the weeds at bay, so that the practices we need to encourage have a chance of taking hold. As they grow and develop, we are constantly called on to cultivate their soil and to stake and prune and protect them.”²

Ron Bleed, recently retired Vice Chancellor for Information Technologies for the Maricopa Community College District, received the 2005 EDUCAUSE Award for Excellence in Leadership, sponsored by SunGardSCT, an EDUCAUSE Platinum Partner. This lifetime-achievement award honors extraordinary influence, statesmanship, and effectiveness on individual campuses and within the higher education community. In his distinguished career, Bleed provided leadership and service to a variety of constituencies for nearly forty years. He raised the bar for technology implementation and utilization at Maricopa, which is today recognized as a national leader in this arena and as an exemplar among community colleges. He was a founder of the League for Innovation’s Conference on Information Technology. He served as chair of the EDUCAUSE board of directors for two terms, as chair of the CAUSE board, as vice chair of the Educom board, and as an important facilitator of the merger between those two organizations. Bleed lent his expertise to the international consulting community and to many corporate advisory councils, including those of Microsoft, Apple, HP, and Oracle. His interests in the teaching and learning field extend to conducting research on strategies for instructional innovation, supporting library transformations, and introducing new ideas into building architecture. As a leader, Bleed blended imaginative foresight with informed hindsight, determination with warmth, and organizational acumen with a valuing of individuals, especially students.



I consider a hybrid or blended course to be one in which a chunk of on-campus classroom time has been replaced by technology-delivered instruction.

The IT leader must support the innovators of the institution. IT projects often center on the proposals and projects requested by innovating faculty and staff. Thus, the IT leader sprinkles water in select areas and watches as ideas grow.

In the third scenario, the IT leader can be seen as an alchemist. Although they no longer mix chemicals together in a fiery pot, today's "alchemists" mix many other types of modern potions. IT leaders are expected to combine elements from higher education to create a valuable commodity in the form of academic and enterprise applications. When they do not produce the expected "gold," or when the promises made about the value of these new systems do not materialize, IT leaders are held in suspect—much like the failed alchemists of the old monarchs. Viewed from another perspective, however, present-day alchemists may simply be making foolsgold, something that only looks like gold in higher education. Colleges and universities are so traditional that they may be asking IT leaders to create a commodity that has little value to today's students and marketplace. Thus, the IT leader's future role may lie less in mixing and brewing the chemicals and more in defining the end product.

In my imagined role as an alchemist, I propose three types of true gold that we can create in higher education—three types that are valuable to students, faculty, stakeholders, and administration alike.

Gold #1: Twenty-First-Century Hybrid Courses

If we in higher education are to be student-centered, we must overcome college and university traditions and move toward a course-schedule redesign that gives greater time flexibility from the student's viewpoint. The Agrarian Age concept of a nine-month school year consisting of two semesters is not the most effective way to deliver instruction in the nonagrarian twenty-first century. Likewise, the Industrial Age paradigm of fixed-seat-time courses moving through an assembly line

of specific curriculum requirements, creating uniformity for the sake of common accreditation measurements and mass production, presents serious obstacles for many of today's students.

Research I conducted shows that replacing some of the fixed seat-time with technology-delivered content and having physical spaces for socialization lead to improved learning, higher completion rates by students, lower costs to both the student and the institution, and greater convenience for students who are not "captured" on a campus. A 2004 Maricopa Community College analysis of the course-completion rates of our students shows that the course schedule is a significant factor in student retention/attrition rates. Because our students are not "captured," the type of course scheduling they experience affects their completion rate. The type of course with the lowest successful completion rate was the traditional, daytime, full-semester course with multiple fixed seat times per week. As Diana Oblinger stated before a U.S. Senate subcommittee in 2004: "One of the best ways of ensuring that students succeed is to remove the barriers to their success. For many, the greatest barrier is the fixed time schedule of a traditional course."³

A strategy to overcome this barrier to student success is creating *hybrid* or *blended* courses. I consider a hybrid or blended course to be one in which a chunk of on-campus classroom time has been replaced by technology-delivered instruction. The advantages of the classroom learning and online learning are combined and the disadvantages of each are minimized.

In March 2004, the EDUCAUSE Center for Applied Research (ECAR) studied the impact of blended or hybrid instructional-delivery formats. The authors of the research bulletin boldly predicted: "Blended learning in higher education is an evolving phenomenon that offers promise for addressing challenges such as access, cost, efficiency, and timely degree completion. In addition, this approach will impact aspects of the acad-

emy such as faculty development and rewards, student retention, college and department structure, as well as the notion of lifelong learning. Our experience is that blended learning is a transformational force, even at the outer edges of its influence. In a real sense, 'We've only just begun!'"⁴

At Maricopa Community Colleges, the primary reason (65%) that students do not successfully complete a degree relates to their personal "life interruptions." The list of life interruptions is long: most students work, in jobs that have changing schedules; most use cars (which are expensive to operate and can break down) to commute to a campus, because minimal public transportation is available; most have financial limitations; many have family obligations; many are subject to illness; and many have difficulties with their housing arrangements. Today's students do not have the luxury of complete dedication of their time toward their courses. In other words, contrary to the popular mythology about students, they are not "captured" by the college or university. The decreasing time that an institution has to engage a student corresponds to less time spent on campus by students.

The longer and more fixed the classroom schedule is, the greater is the probability that students will encounter a life interruption that will disrupt their learning experience. Many colleges and universities agonize over the retention and attrition rates of students, and most recognize the life interruption issue. Many interventions and new programs have been proposed as solutions. Yet the most effective solution is not often proposed: making traditional, fixed-seat-time courses more flexible.

Hybrid/blended courses fit this model. The movement to hybrid/blended courses is dependent on learning management systems, digital libraries, emerging mobile technologies, and the reuse of learning objects and materials. Colleges and universities must look toward innovative uses, common interfaces for students and faculty, cost-efficiency

Informal learning spaces support student-to-student and student-to-faculty conversations and group study about course content.

through sharing and consolidation, and new kinds of technological access to the home and to the mobile student to make the hybrid/blended model effective.

In the five years since I published the article “A Hybrid Campus for the New Millennium” in *EDUCAUSE Review*,⁵ the movement for hybrid/blended courses has grown. Although no national statistics are available, a review of presentations at higher education instructional and information technology conferences and/or a Google search on the words *hybrid course* or *blended course* indicate widespread interest and development. It is a movement driven from the ground up, by faculty and departments. And it is a movement that may soon turn into a revolution.

Gold #2: Twenty-First-Century Learning Spaces

The schoolhouse of the twenty-first century redefines the importance of place. The design of new spaces that encourage the missing socialization of today’s college and university students is strategic. I believe that spaces supporting the movement toward hybrid courses and social learning must be a priority for higher education institutions in the twenty-first century.

First, the case for social learning needs to be emphasized. In *The Social Life of Information*, John Seely Brown and Paul Duguid claim: “As much learning happens outside the classroom as inside.” The key to learning is “rubbing shoulders with multiple sensibilities.”⁶ Second, research shows that successful learning should be active, contextual, engaged, interactive, and social.⁷ However, among the majority of students at Maricopa Community Colleges—and, perhaps, at many other colleges and universities—the social aspects of learning are declining. The new designs for learning spaces must emphasize social learning.

To address this situation, Maricopa’s Estrella Mountain Community College hosted a focus session on “Design of Informal Learning Spaces,” conducted by the EDUCAUSE Learning Initiative (ELI),

and another focus session on this topic for Maricopa Community College attendees. These sessions featured presentations by experts on learning and building design, tours of some exemplary spaces on the Estrella campus, and group discussions among the participants.⁸

The ideas of William Mitchell, the dean of the School of Architecture at MIT, can help further the work of these sessions and outline the process of creating informal spaces for learning. According to Mitchell, the first step in this process is “fragmentation.” He explains: “You get to these kinds of understandings by first fragmenting, then recombining in new patterns. You have new freedom to assemble the parts in new ways.” One of Mitchell’s key concepts is that “proximity to scarce resources” drives the recombining process for space. Historically, campuses were built to give students proximity to the scarce resources of teachers and libraries. Moving from the ancient concept of one teacher at the end of the log for each student, then to itinerant teachers traveling about the countryside, the first campuses were designed to bring many students to a collection of teachers at a single physical place. After many centuries, that model continues to exist. Scarcities of books, equipment, and laboratories also contributed to the building of campuses. Within the campus, scarce resources determine educational processes.⁹

The job of college and university planners today is to analyze the changing requirements for proximity to scarce resources. Social learning and human interactivity are now scarce resources in the learning processes. On the other hand, the delivery of instructional content is no longer a scarce resource because many new and alternative delivery technologies and methods are proving to be effective.

Consequently, new designs of spaces for socialization and interaction must compensate for this emerging scarcity by including informal learning spaces. Informal learning spaces support student-to-student and student-to-faculty conver-

sations and group study about course content. Informal spaces create an environment in which students can talk informally and experience some of the other dimensions of becoming an educated person. Informal spaces make the campus “sticky” to the students: they stay on campus rather than immediately heading to the parking lot and driving away in their cars.

Even a residential campus needs new design of spaces. For example, Stanford University built informal social learning spaces with the help of student surveys and focus groups. The students’ requirements for informal learning spaces included flexibility, comfortable and ergonomic seating, “noise zones,” food and drink, and pervasive technology. As the authors of an ECAR research bulletin noted, these are the same characteristics that can be found in Starbucks coffee shops and Borders bookstores. “The space is communal, furniture is comfortable, lighting is good, there are often community-based media (large-screen displays), and access to learning resources (wireless networks, books, newspapers, and magazines). Food and beverages are available, and through ‘social magic,’ numerous groups form, function, learn, laugh, and disband in short or extended periods of time.”¹⁰

Informal learning spaces include outside areas and the entire campus environment. Design considerations for areas such as walkways, benches and seats, and ramadas are essential. Alan Kay, the renowned computer engineer, mentioned these design areas to me fifteen years ago when he visited the then-new Glendale Community College High Tech Center. As I took him on a tour around the facility, he was less impressed than the other thousands of visitors who had seen the center. He commented that we should not invest so much money in bricks (facilities) but instead should invest in outside wired ramadas and picnic tables. (This was before wireless networks.) He said, “You live in Arizona; take advantage of it.”

A more current example of new campus space designs is described by Diane

The preservation of traditional literacy formats and their use in the classroom will work to the detriment of an increasingly large number of students.

Troyer, the president of Cy-Fair College in Texas. Troyer noted: "Because we are a commuter campus we had to create incentives, namely a striking physical plant, to keep students on campus. We don't just want them to take classes, get in their car, go to their second job, and come back." She added: "The college is built on collaborative learning. It's designed to support active learning from the classroom to the external informal spaces." To encourage active learning, Troyer made the two-hundred-acre campus completely wireless, even the outdoor spaces. "It's not uncommon to see students sprawled on the grass with laptops or curled up with a book," she says. "We wanted to create an environment that was collegiate, but also flexible. We understood that we need to engage our adult learners."¹¹

Key ingredients to creating learning spaces are the elements of food and coffee, technology connections, furniture, lighting, and music. Yet introducing these elements in traditional libraries and classroom buildings can sometimes be difficult. Some faculty and administrators may resist the idea. Physical and architectural limitations may impede the building of such spaces. But designing these informal learning spaces is worth the trouble. Maricopa's Mesa Community College had the courage to build a cyber-café designed almost entirely by students. The result is the most attractive and futuristic facility on that campus.

The social learning that is being proposed can also occur at off-campus locations. Moving the learning experiences closer to the workplace or community integrates learning with the real-life environment and increases accessibility for students. Commercial establishments already exist for this kind of learning. For example, the new space characteristics can be found at Starbucks coffee shops and at Borders bookstores. I spend time each week at both establishments because I like coffee and I like books. However, another reason I spend time at these places is the comfort they provide. As the saying goes about the popularity of Star-

bucks stores: "They give back twenty minutes of your hectic life each day." Why are so many people so willing to pay so much for a cup of coffee? Maybe Starbucks has figured out the social needs of people today. Another major design of both Starbucks and Borders are that they are often nearby. They are generally located in places to which people go for other purposes.

If colleges and universities are in the people business, they must place greater emphasis on creating the environments that will improve students' learning and increase students' comfort and convenience. Administrators should follow the example of Coen Free, the president of King William I College in the Netherlands. When I discussed the concepts of designing informal learning spaces, he immediately built a Mexican cantina in the middle of his high-tech center, the School for the Future, on the college campus.

Gold #3: Twenty-First-Century Literacy

Evidence of a form of literacy from two thousand years ago can be seen in Arizona. The Native Americans told stories with rock art, or petroglyphs. Many of the petroglyphs still exist today in the Arizona desert. Kokopelli, the flute player, is a very popular symbol. However, the literacy represented by rock art changed, many centuries ago, to a literacy composed of words and text. Likewise, in 2005, another form of literacy is overtaking words and text. This literacy—the literacy of the twenty-first century—will be composed of digital images and of sounds as well as of words and text. Thus, the preservation of traditional literacy formats and their use in the classroom will work to the detriment of an increasingly large number of students.

I would like to start building my case for the twenty-first-century literacy by quoting two well-known figures. First, the filmmaker George Lucas was asked: "What do students need to be learning that they're not?" He answered: "They need to understand a new language of expression. The way we are educating is

based on 19th-century ideas and methods. Here we are, entering the 21st century, and you look at our schools and ask, 'Why are we doing things in this ancient way?' Our system of education is locked in a time capsule. You want to say to the people in charge, 'You're not using today's tools! Wake up!'"¹²

Second, Microsoft Chairman Bill Gates minced no words when, in speaking to the governors of the United States, he said: "Our high schools . . . cannot teach our kids what they need to know today. Our high schools were designed fifty years ago to meet the needs of another age. Until we design them to meet the needs of the 21st century, we will keep limiting—even ruining—the lives of millions of Americans every year."¹³

Reasons for Change

I propose four reasons for the need to change to a new form of literacy.

Reason #1: Twenty-First-Century Students. By the age of twenty-one, the average student today will have spent more than 10,000 hours playing video games, will have sent or received over 200,000 e-mails and instant messages, will have talked for more than 10,000 hours on a cell phone, will have spent over 20,000 hours watching television, and will have spent, at most, 5,000 hours reading books.¹⁴ We all have our own stories about the aptitude of young people with the new technology. My daughter Michelle uses technology in teaching her kindergarten class at Grayhawk Elementary School in Scottsdale, Arizona. Inside her classroom is as much technology as is in many college and university classrooms: three computers for Internet access and a broadband television network on the wall, with a full computer lab located down the hall. She uses the Internet as a reward for her young students.

Reason #2: The Tipping Point. The phrase *tipping point* is a sociology term that refers to that dramatic moment when something unique becomes common. The year 2004 was the tipping point for the

digital video and music world. Dramatic increases were experienced in the consumer market for digital video and music: for example, 150 million camera phones were sold worldwide in 2004, and the number of homes with digital video recorders increased 119 percent in 2004.¹⁵

Reason #3: High Tech, High Touch, High Concept. Twenty or so years ago, at the advent of the personal computer revolution, one of my favorite books was *Megatrends*, by John Naisbitt. He introduced a term that became very popular: “High Tech leads to a corresponding High Touch reaction.” Daniel Pink has extended those concepts in his book *A Whole New Mind*. He says that the current generation had technology build upon their left-brain abilities of logic, analysis, literalness, and sequential. Now, the right-brain abilities of creativity, empathy, pattern recognition, and the making of meaning will be needed to create “high touch” and “high concept.” Pink claims that the Industrial Age was built on people’s backs and that the Information Age was built on people’s left brains.

The new “Conceptual Age” will be built on people’s right brains. We will move to a society of creators, empathizers, pattern recognizers, and meaning-makers.¹⁶

Reason #4: Visual Literacy Skills. Nearly every profession and many jobs will require visual literacy skills in the twenty-first century. The challenge for higher education is how to give students the literacy skills they need to effectively create and interpret visual content. For example, imaging is the basis for more and more medical diagnostics. All jobs in allied health now require visual digital literacy skills.¹⁷

Strategies to Infuse

Twenty-First-Century Literacy

Although visuals and media proliferated to become ubiquitous in society during the twentieth century, word and text still dominate literacy efforts within schools. Twenty-first-century literacy is often considered trivial or transitory and even nonacademic. Twenty-first-century literacy is outside any mainstream literacy

curriculum. It is taught only in specialized courses in disciplines such as art and architecture.

How can colleges and universities be relevant when they ignore this major force in society? How can colleges and universities *not* teach the type of literacy that students use most? In the recent documentary and companion book *Declining by Degrees*, students characterized their college experiences as boring.¹⁸ Why not use the new media to bring energy and interest into the classroom? How come higher education continues looking to the past rather than toward the twenty-first century?

Because of these omissions, all colleges and universities need to take programmatic actions to prepare students. I suggest three strategies here.

Strategy #1: A New Twenty-First-Century Literacy Course. A new course could be designed for twenty-first-century literacy skills. Such a course could look like the one that has been developed by Susan Metros at Ohio State University. Mark

Kann, chair of the Political Science Department at the University of Southern California, has stated: "I wouldn't be too surprised if at some point a multimedia program that is the equivalent of freshman writing will start appearing at universities. It will become a requirement for graduation."¹⁹

Strategy #2: Twenty-First-Century Literacy across the Curriculum. The second strategy to advance twenty-first-century literacy is to program it "across the curriculum" by encouraging and supporting all faculty to assign student projects that use visual and aural media. An example of success with this approach occurred in the anthropology courses taught at Mesa Community College by Rick Effland. Instead of a ten-page typed research paper, Effland had the students create digital movies. He found that the amount and quality of the research done by the students in a video format far exceeded the quality of their work done with written papers. The students were more engaged, worked more collaboratively, and learned

more when they used visual media.²⁰


Another example is the Beijing Project at Colgate University. A Colgate faculty member and Raymond Nardelli, senior instructional technology analyst at Colgate, took nineteen students to Beijing and gave them an assignment requiring them to express what they learned. All nineteen used video cameras, digital still cameras, audio equipment, and tablet computers to cover different aspects of Beijing such as nature, transportation, Tiananmen Square activities, childhood, music, fashion, neighborhoods, and markets.²¹

Strategy #3: Teacher-Education Programs. Any teacher-education program that embraces the teaching of the new literacy will be on the cutting edge in the United States. (Europe and Australia have more momentum in this area.) Pace-setting institutions will attract favorable sponsorship, support, and recognition. Colleges and universities need to serve as a bridge between teacher-education programs and technology corporations, foundations, and influential associations.

Challenge: IT Leadership Opportunity

I gave a presentation on visual literacy at the 12th Sedona Conference & Conversations in the summer of 2005. Bernard Luskin, the author of *Casting the Net over Global Learning*, reacted strongly. He liked the idea that an oldtime IT leader has seen the light and is advocating for the new literacy. He claimed that when IT people merge with film, art, music, and design people, the result will be the literacy our students need for their future.

Although many people and many disciplines will participate, IT professionals can be critical contributors to the process of transforming the higher education enterprise to educate and train people for the twenty-first century. IT leaders have the required experience and skills. In some instances, IT leaders will work as plumbers, maintaining the technology infrastructure—such as Internet2—that supports new media. In other cases, they will work as gardeners, cultivating the innovative ideas of faculty. But most important, IT leaders can work as alchemists,

bringing people, technologies, and learning content together to produce true gold: twenty-first-century hybrid courses, learning spaces, and literacy. 

Notes

1. Ron Bleed and Brian Hawkins, "Effective Technology Leadership Strategies for Community Colleges," presentation at the 2003 Conference on Information Technology, League for Innovation in the Community College, Milwaukee, Wis., October 20, 2003.
2. Polley Ann McClure, "Managing the Complexity of Campus Information Resources," in Polley Ann McClure, ed., *Organizing and Managing Information Resources on Your Campus*, EDUCAUSE Leadership Strategies, Vol. 7 (San Francisco: Jossey-Bass, 2003), 12.
3. Testimony of Diana G. Oblinger, Ph.D., Executive Director of Higher Education, Microsoft Corporation, to the U.S. Senate Committee on Health, Education, Labor, and Pensions, on "Higher Education and the Workforce: Issues for Reauthorization," March 4, 2004, <http://help.senate.gov/testimony/t64_tes.html>.
4. Charles D. Dziuban, Joel L. Hartman, and Patsy D. Moskal, "Blended Learning," *EDUCAUSE Center for Applied Research (ECAR) Research Bulletin*, vol. 2004, issue 7 (March 30, 2004): 11, <<http://www.educause.edu/ir/library/pdf/ERB0407.pdf>>.
5. Ron Bleed, "A Hybrid Campus for the New Millennium," *EDUCAUSE Review*, vol. 36, no. 1 (January/February 2001): 16-24, <<http://www.educause.edu/ir/library/pdf/erm0110.pdf>>.
6. John Seely Brown and Paul Duguid, *The Social Life of Information* (Boston: Harvard Business School Press, 2000).
7. Paul Hagner, "Leading the Transition from Classrooms to Learning Spaces," presentation at Ocotillo Learning Spaces Day 2005, Estrella Mountain Community College, Avondale, Ariz., September 16, 2005.
8. "Design of Informal Learning Spaces," ELI 2005 Fall Focus Session, Estrella Mountain Community College, Avondale, Ariz., September 14-15, 2005, <<http://www.educause.edu/eli054>>; Ocotillo Learning Spaces Day 2005, Estrella Mountain Community College, Avondale, Ariz., September 16, 2005, <<http://www.mcli.dist.maricopa.edu/ocotillo/spaces05/>>.
9. William J. Mitchell, presentation at Sun Computer Education Research Conference, San Francisco, Calif., February 24, 1999; William J. Mitchell, *City of Bits: Space, Place, and the Infobahn* (Cambridge, Mass.: MIT Press, 1995).
10. Stephen R. Acker and Michael D. Miller, "Campus Learning Spaces: Investing in How Students Learn," *EDUCAUSE Center for Applied Research (ECAR) Research Bulletin*, vol. 2005, issue 8 (April 12, 2005): 6, <<http://www.educause.edu/LibraryDetailPage/666?ID=ERB0508>>.
11. Alana Klein, "The Space Challenge," *University Business*, April 2005, p. 78, <<http://www.universitybusiness.com/page.cfm?p=777>>.
12. James Daly, "Life on the Screen," *Eutopia*, September/October 2004, <http://www.glef.org/magazine/ed1article.php?id=art_1160&issue=sept_04>.
13. Bill Gates, "National Education Summit on High Schools," February 26, 2005, <<http://www.gatesfoundation.org/MediaCenter/Speeches/BillSpeeches/BGSpeechNGA-050226.htm>>.
14. Marc Prensky, "Digital Natives, Digital Immigrants, Part II: Do They Really Think Differently?" *On the Horizon*, vol. 9, no. 6, December 2001, <<http://www.marcprensky.com/writing/>>.
15. Figures: accessed from <<http://blogs.zdnet.com/ITFacts/>>, March 18, 2005.
16. John Naisbitt, *Megatrends: Ten New Directions Transforming Our Lives* (New York: Warner Books, 1984); Daniel H. Pink, *A Whole New Mind: Moving from the Information Age to the Conceptual Age* (New York: Riverhead Books, 2005); Daniel H. Pink, "Revenge of the Right Brain," *Wired*, issue 13.02 (February 2005), <<http://www.wired.com/wired/archive/13.02/brain.html>>.
17. Anne Morgan Spalter, Andries van Dam, Pinny Sheoran, and Oris Friesen, "Digital Literacy: A White Paper," April 2005.
18. Richard Hersh and John Merrow, eds., *Declining by Degrees: Higher Education at Risk* (New York: Palgrave Macmillan, 2005). Also on DVD and VHS.
19. Susan Metros, correspondence with the author, 2004; Kann quoted in Elizabeth Daley, "Expanding the Concept of Literacy," *EDUCAUSE Review*, vol. 38, no. 2 (March/April 2003): 40, <<http://www.educause.edu/ir/library/pdf/ERM0322.pdf>>.
20. Richard Efland, conversation with the author, October 18, 2004.
21. "Class Will Use Modern Tools to Explore Ancient Beijing," *Colgate University News*, May 11, 2004, <<http://www.colgate.edu/DesktopDefault1.aspx?tabid=730&pgID=6013&nwID=2624>>; Raymond Nardelli, "Beijing, China: Seen through the Lens of Students," presentation, NLII Annual Meeting, New Orleans, La., January 25, 2005.