

Enhancing Teaching with Technology: Are We There Yet?

by Sharon Kopyc

Imagine a scene in which groups of tech-savvy students wander among dusty library stacks seeking the books and articles from the recommended hard-copy lists given to them by their professors. With [iPods](#) and smart phones intact, they do one-handed text messaging and then plunk down their wireless laptops and check their e-mail before earnestly hunting down a book's call numbers. Eventually, they go searching for those texts, finally reach the right floor, but are frustrated when the text is not there or is not what they thought it would be. They go back to their laptops, and using Boolean operators, online databases, and interactive Web sites, all found via [Google](#), they locate what they need: a novella by George Eliot from [Project Gutenberg](#), literary criticism on Emily Dickinson's poems from the [Dickinson Electronic Archives](#), and research on Ansel Adams from the Smithsonian's online service [Ask Joan of Art](#). Then they instant message their classmates to ask for clarification about the assignment, and dialogue ensues about their respective research efforts along with exchanges of Web addresses for several popular [political blogs](#). Once they have found the sources they need for their projects, they cite those works using the bibliographic software [NoodleBib](#).

Perhaps this scenario, although fabricated, is a familiar one in schools and libraries today. This image of tech-savvy students wandering a text-dominated landscape originates from the title of Farris-Berg's report ([2005](#)) for [Education/Evolving](#), an initiative interested in student views about education. The report combines and summarizes research on student attitudes, perceptions, and behaviors with regard to using digital technology, particularly for learning purposes. The summary of student voices in the report indicates student awareness of the role technology plays in changing and shaping how they learn, but these students also voice their teachers' use/nonuse of technology in teaching. Specifically, the report finds that "students want challenging, technologically oriented instructional activities" and, citing Kvavik's research ([2005](#)), asserts an extremely cogent point: "College students say that course management software features used least by faculty were the features that students indicated contributed the most to their learning, such as sharing materials with students, faculty feedback on assignments, and online readings" (11). Students claim that their schools and teachers have not yet recognized—much less responded to—the fundamental shift occurring in the students they serve and in the learning communities they are charged with fostering.

What factors contribute to the disconnect between the practices in which faculty engage and the potential that technology currently holds to transform such practice? More importantly, what can institutions do to help motivate their faculty to cultivate the technological skills, knowledge, and strategies necessary to meet the needs of a new generation of students?

Faculty Responses to Technology: The Gap Between Potential and Practice

To answer these questions, we must first take an honest look at faculty engagement regarding the use of technology in their teaching strategies. This issue continually challenges academic computing staff at the university level. While it is true that faculty use computers every day to send e-mail, compose texts with word processing, and search the Web, the number of faculty members using technology to enhance their teaching is relatively low.

Five years ago, the [Campus Computing Project](#) reported that over 600 two- and four-year public and private colleges and universities in the United States "identify 'assisting faculty integrate technology into instruction' as the single most important IT issue confronting their campuses 'over the next two or three years'" (Green [2001](#), ¶ 10). When the same survey was conducted two years later, Green reported that only 33.6% of faculty

use course management tools for online course resources and just 37.4% place materials on the Web despite wide availability of technology and support services ([2003](#)). More recently, the *EDUCAUSE Core Data Service Fiscal Year 2004 Summary Report*, a survey about campus information technology environments at 890 colleges and universities in the U.S. and abroad, found that "only 19% of ALL campuses report that these systems are for all or nearly all courses" (Hawkins, Rudy, and Nicolich [2005](#), 36).

The technical infrastructure, support staff, and training opportunities exist, so what is holding faculty back from embracing technology-enhanced courses? Faculty claim that a lack of time, a lack of skills, and a general discomfort with the educational technology culture impede their use of it (Gustafson 2003-2004). The low rates of implementation suggest that faculty, in general, do not recognize their nonparticipation as a problem. Examining the disparity between faculty's low use of technology and the widespread availability of technological resources on campuses suggests that there are peculiarities to the academic digital divide that need to be identified before it can be dismantled.

According to Claudia Perry, associate professor in the Graduate School of Library and Information Studies at Queens College, City University of New York ([CUNY](#)), a troubling gap remains between the promise and reality of technology-related innovative instructional and learning practices in much of higher education ([2004](#)). Duderstadt, Atkins, and Van Houweling similarly note this gap in *Higher Education in the Digital Age*:

. . . the university stands apart, almost unique in its determination to moor itself to past traditions and practices, to insist on performing its core teaching activities much as it has in the past. The lecture method is literally unchanged from its introduction centuries ago, and many technology innovations remain in limited use. (2002, 57)

This gap is partially caused by the simple fact that the technological cart was put before the academic horse, and a strong shift to flip this around is desperately needed. In other words, pushing technology on academics, the drivers of education, will not get technology into the classroom unless academics first understand the technology and its relevance in the classroom. Just training people how to use the technology is not enough; rather, support staff should also work to educate academics about the available technologies and their possibilities. Currently, no good model has accomplished this aim; we have seen that the corporate training model does not work and, as Duderstat, Atkins, and Van Houweling suggest, the university's model of past traditions does not easily and effectively accommodate the integration of technology innovations (2002). Certainly, a need to get everyone talking to each other—academic computing staff, faculty, and administrators—is the first crucial step in the development of new models that bridge this divide.

Creating Partnerships: Multiple Strategies

A commonsense approach to overcoming this gap is to develop sustaining partnerships among students, faculty, academic computing staff, and administrators. However, encouraging those who teach to take on the challenge of integrating technology in their work is particularly crucial because they are in the best position to evaluate their students' new technology-driven productions of knowledge. Promoting faculty engagement with instructional technologies presents the major challenge for institutions; in meeting this challenge, institutions should adopt multiple strategies on multiple fronts.

Typically, computing departments have been charged with addressing this issue, and over the past decade, their means of doing so have ranged from localized forms of faculty outreach to more organized events and initiatives. Grassroots approaches—for example, having computing staff visit faculty offices to increase contacts and relationships—are familiar techniques adopted by computing departments. In turn, computing staff have participated in faculty development workshops that either focus on particular technological tools or address more generalized topics such as improving classroom discussion and fostering student research skills. Meanwhile, computing departments have offered workshops for their own staff to explore how to engage faculty in the process of technology training; for example, at the December 2005 [workshop](#) held by the NorthEast Regional Computing Program ([NERCOMP](#)) at Holy Cross College, computing staff shared

experiences in promoting faculty engagement with the IT department. Despite the progress that has been made through such efforts, computing staff often complain that more staff than faculty attend technology training workshops at their institutions.

As a further strategy, committees designed to discuss computing and technology issues, commonly referred to as information resource councils (e.g., the [Kansas Information Resource Council](#)), typically identify technology needs for educational institutions. However, even those committees have not been demonstrably effective in furthering faculty engagement with IT; the office visits, technology training, and product fairs have reached some faculty, but they are often ad hoc efforts, planned and developed by academic computing staff who admit their limited success. It is perhaps for this reason that institutions such as the University of Washington have recognized the need to include faculty in the planning of technology workshops as well as in the committees that initiate them; the university has formed focus groups that invite faculty input into this divide (Alway, Lewis, and Macklin [2000](#)), and Perry ([2004](#)) reports similar ongoing discussions between faculty and staff at Queens College regarding the incorporation of IT in the classroom.

What these trends suggest is that despite the hyperbole we experience daily in our e-mails, in the media, and on slick college Web sites about the ubiquitous presence of technology on campus, much work has yet to be done to get all stakeholders behind technologically enhanced pedagogy. They also suggest that while grassroots efforts, workshops, and committees remain valuable avenues for fostering faculty engagement with technology, such strategies should also be supplemented by further measures that help tackle the technology conundrum in a more sustained way. Below are models of how three different campuses have adopted further strategies to achieve this goal; although other models undoubtedly exist, these examples illustrate the need for initiatives that are solidly integrated in the institution and that meet the needs of a particular academic culture.

Teaching Forums

At [Bard College](#), the Center for Faculty and Curriculum Development ([CFCD](#)) was created to identify and organize faculty programs that concern curriculum development. After administration and computing staff discussed the problem of the staff's tendency to take the lead in determining programs about technology and teaching, the CFCD emerged as the vehicle for meaningful discussions about the use of technology in teaching. While the CFCD committee still consists of representatives from faculty, computer staff, and administration, its discussions are most often led by faculty—as they should be—and any plans for instructional technology workshops are likely to be facilitated through this forum.

Through such teaching forums, faculty have the crucial opportunity to share their various concerns about technology, thereby fostering a continued focus on pedagogical value and relevance while providing feedback to administrators and computing staff. To be sure, faculty discussions may often involve a measure of controversy. For example, in one early forum, a junior faculty member at Bard reported his success in using an electronic bulletin board to extend class discussions; in response, a senior faculty member stated an opposing view—that he would not want his students to take over the direction of the discussions. Cases such as this indicate how teaching forums can foster healthy debate regarding the role technology can play across different disciplines and in different learning contexts. In fact, this discussion was the impetus for a faculty-led forum on the uses of electronic discussion boards, which, in turn, prompted another presentation on the benefits of online quizzes. By providing a relatively stressfree opportunity for discussing these issues without an overly specialized focus on the technology tools themselves, the CFCD teaching forum has helped to bridge the gap between faculty development efforts in technology and the everyday practice of teaching and learning. Another encouraging result from this forum is the faculty-initiated and/or faculty-led technology workshops that have emerged from the connections and partnerships developed among members.

Faculty Technology Fellowships

[Lehigh University's](#) Lehigh Lab understands that the notion of partnership includes the entire university. Their

Web site asserts: "The Lab concept is founded upon the idea that the University as a whole is a laboratory in which faculty, staff, and students work and experiment together, across departments and disciplines, to advance learning" ([2006](#), ¶ 1). As a key component of this mission, Lehigh supports a technology fellow program so that faculty can apply for release time to develop skills and create technology-enhanced courses. Recognizing the importance of collaboration and partnership, the program requires faculty to work with other experienced fellows and academic computing staff. Too often, faculty who do embrace technology in their teaching are not adequately recognized or rewarded for their efforts; such fellowship programs address this problem while demonstrating administrative support for and involvement in faculty development efforts.

The Technology Resource Learning Center ([TRLC](#)) is a crucial part of the Lehigh Lab, and its director of faculty development and the coordinator of the Lehigh Lab collaborate to improve the quality of teaching and learning at Lehigh by offering faculty a wide range of resources, including consultation on the use of technology. Those faculty members interested in discussing pedagogically sound uses of academic technologies begin with a visit where they are supported with examples, ideas, and help for their projects. Ed Gallagher, the Lehigh Lab Faculty Fellow and chair of the Lehigh Lab Steering Committee, is a motivator, mentor, and facilitator of innovation in teaching and learning. Faculty who wish to meet with a senior faculty member to learn more about how to upgrade from the traditional to the technological meet with Gallagher, who is personally familiar with the challenges and rewards of such a transition.

Just-in-Time Training

[Juniata College](#)'s Solutions-on-Site ([SOS](#)) initiative successfully provides faculty with a relatively inexpensive just-in-time training model that is supported by work-study students. While it cannot substitute for in-depth training, it provides busy faculty with needed consultation and assistance with applications from [Word](#) to [Dreamweaver](#).

The SOS initiative helps to address the limitations of the continuing education/corporate model of faculty training that has been used at institutions for the past decade. While group training sessions moderated by computing staff remain an indispensable approach for faculty development, they may often conflict with the schedules of faculty; some faculty members may also find such sessions impersonal or otherwise unappealing because of their formal structure. Whether faculty members are too busy to attend training sessions, are suspicious of the corporate model, or are too uncomfortable to be seen fumbling at a public computer lab, they do respond to opportunities such as those provided by the Juniata model where they can get help for a specific task or problem in the comfort of their own office.

By providing additional ways to encourage, reward, and support faculty efforts at technology integration, the approaches outlined above offer worthy models for institutions as they seek to address their own digital divide. While the impact of any single strategy is likely to be limited, a diverse combination of such strategies will help ensure that faculty have as many opportunities as possible to establish productive and lasting partnerships as they explore new ways to enhance their teaching practice.

Connecting Faculty with Research-Based Models

In addition to providing a diverse range of training and professional development opportunities, institutions need to connect faculty to current research that demonstrates the pedagogical value of technology in learning contexts. It is reasonable to expect that faculty must have a clear rationale to change tried and tested teaching methods and clear evidence to support that rationale. Rhetorical claims about the added value of technology tools (too often pushed on faculty by computing staff members) will take on more significance when faculty can see specific examples of pedagogical relevance and when faculty have opportunities to participate in research-based programs that have set notable precedents for academic success.

One example of such a research-based program is the Program for Course Redesign ([PCR](#)), a five-year effort funded by the Pew Charitable Trust. The PCR program involves college professors from across the

nation and supports their planning, integrating, and evaluating classroom technology use, and their work has yielded a range of discipline-specific data to support significant findings and simple, commonsense conclusions. Their overall findings suggest that students benefit most from a "buffet of learning activities" that targets a range of cognitive and skill levels and helps provide an individualized learning experience (Twiggs 2001, ¶16). Towards this end they have developed five [models](#) of course redesign—as well as an overall [methodology](#) based on these five models—that have been implemented at a variety of institutions; in addition, they document the results of these course redesign projects in a series of [outcome reports](#). Additionally, the methodology for redesign that the PCR provides is scalable, which makes it particularly worth considering by smaller institutions. If institutions encourage faculty and academic computing staff either to participate in research grants like those offered by Pew or to attend the meetings that summarize the findings of such research, all involved will benefit by gaining new information and opportunities for expanded partnerships.

Conferences that include workshops on research-based use of technology in teaching might also provide faculty with a needed push. For example, Hartman, Dziuban, and Moskal (2000) compiled a decade's worth of data at the University of Central Florida that would be impressive even to technophobic faculty; they found that traditional courses enhanced by technology produce greater numbers of students earning A, B, or C grades as well as fewer withdrawals by students overall. Findings of this weight are presented at many conferences, including [EDUCAUSE](#), [The Sloan Consortium](#), and [Academic Impressions](#). Such research persuades faculty members of not only the inherent worth of technology as a facilitator in the classroom but also the demonstrable benefit of technology to their students' academic performance. Delivering this information in a workshop setting allows faculty members to collaborate on new strategies that follow up on the available research and to discuss how these strategies can be implemented in different environments.

Conclusion

Too often faculty remain wary of integrating technology in their teaching because they do not want to succumb to a one-size-fits-all model that fails to accommodate their individual pedagogical practices; perhaps the best way to address this concern as well as other faculty concerns and anxieties would be to avoid an all-encompassing model of faculty development. By establishing multiple links between computing staff and faculty, institutions can better support the growth of sustained partnerships that explore diverse, relevant, and effective uses of technology in teaching. As Perry states, "Getting the word out . . . is among the most important attributes of a successful effort to implement a new technology-based learning environment" (2004, 36). Faculty workshops can certainly help to get the word out, but efforts such as Bard's CFCD faculty committee, Lehigh University's technology fellowship program, and Juniata College's SOS initiative provide additional venues and strategies for spreading the word. In turn, exposing faculty to research-based models of successful integration will go a long way towards inspiring them to realize the potential of technology in their own teaching.

After our review of the various psychological, pedagogical, educational, and technological issues confronting the integration of technology into teaching, we would like to end by reiterating the philosophy of Lehigh Lab: "The University as a whole is a laboratory in which faculty, staff, and students work and experiment together." While we as computing staff, faculty, and administrators may not be there yet, the net generation students have arrived, and their increasing expectations for e-learning cannot be easily dismissed.

References

Alway, M., T. Lewis, and S. Macklin. 2000. A catalyst for collaboration: Supporting technology in teaching through partnerships. Paper presented at the EDUCAUSE 2000 conference, Nashville, TN, October. <http://www.educause.edu/ir/library/pdf/EDU0036.pdf> (accessed November 29, 2006).

Duderstadt, J. J., D. E. Atkins, and D. Van Houweling. 2002. *Higher education in the digital age: Technology issues and strategies for American colleges and universities*. Westport, CT: Praeger Publishers.

Farris-Berg, K. 2005. *Listening to student voices—on technology: Today's tech-savvy students are stuck in text-dominated schools*. St. Paul, MN: Education/Evolving, Center for Policy Studies and Hamline University. http://www.educationevolving.org/studentvoices/pdf/tech_savy_students.pdf (accessed November 29, 2006).

Green, K. C. 2001. The 2001 National Survey of Information Technology in U.S. Higher Education: eCommerce comes slowly to the campus. <http://www.campuscomputing.net/summaries/2001/index.html> (accessed November 29, 2006).

Green, K. C. 2003. The 2003 National Survey of Information Technology in U.S. Higher Education: Campus policies address digital content and copyright; wireless networks show big gains. <http://www.campuscomputing.net/summaries/2003/index.html> (accessed November 29, 2006).

Gustafson, K. 2003-2004. The impact of technologies on learning. *Planning for Higher Education* 32 (2): 37-43.

Hartman, J., C. Dziuban, and P. Moskal. 2000. Faculty satisfaction in ALNs: A dependent or independent variable? *The Journal of Asynchronous Learning Networks* 4 (3). http://www.sloan-c.org/publications/jaln/v4n3/v4n3_hartman.asp (accessed November 29, 2006).

Hawkins, B. L., J. A. Rudy, and R. Nicolich. 2005. *EDUCAUSE core data service: Fiscal year 2004 summary report*. Washington, DC: EDUCAUSE. <http://www.educause.edu/ir/library/pdf/pub8002.pdf> (accessed November 29, 2006).

Kvavik, R. B. 2005. Convenience, communications, and control: How students use technology. In *Educating the net generation*, ed. D. G. Oblinger and J. L. Oblinger. EDUCAUSE Center for Applied Research. <http://www.educause.edu/ir/library/pdf/pub7101g.pdf> (accessed November 29, 2006).

Lehigh University. 2006. Lehigh Lab home page. <http://www.lehigh.edu/lehighlab/> (accessed November 29, 2006).

Perry, C. 2004. Information technology and the curriculum: A status report. *Educause Quarterly* 27 (4): 28-37. <http://www.educause.edu/apps/eq/eqm04/eqm0444.asp> (accessed November 29, 2006).

Twigg, C. 2001. *Innovations in online learning: Moving beyond no significant difference*. Troy, NY: Center for Academic Transformation, Rensselaer Polytechnic Institute. <http://www.center.rpi.edu/Monographs/Innovations.html> (accessed November 29, 2006).

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Note: This article was originally published in *Innovate* (<http://www.innovateonline.info/>) as: Kopyc, S. 2006. Enhancing teaching with technology: are we there yet?. *Innovate* 3 (2). <http://www.innovateonline.info/index.php?view=article&id=74> (accessed April 24, 2008). The article is reprinted here with permission of the publisher, [The Fischler School of Education and Human Services](#) at [Nova Southeastern University](#).

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