

Supporting Pedagogy in Higher Education

IT plays a major role in bolstering teaching, learning and research — and these best practices can help put your institution on the right track.

1. Expand IT services and provide easy, integrated access to them
2. Adopt a pedagogical framework and align your IT initiatives to it
3. Forge communications links with faculty, students and administrators
4. Find early adopters among the faculty and try out new technology in their labs and classrooms
5. Enable meaningful measurement in educational programs

These days, information technology is as central to the operation of higher education institutions as it is to that of banks or retail chains. And while some technology resources are dedicated to collegiate back offices, the primary job of IT must be to support the core activities of the institution of higher learning — teaching, learning and research.

“Today technology permeates every aspect of the business of higher education,” says Dwight Fischer, CIO at Plymouth State University in Plymouth, N.H. “We are sometimes overwhelmed by the demands of implementing and maintaining systems like ERP [enterprise resource planning], security and e-mail, but we can’t lose sight of education.”

The number of IT assets and systems at any institution of higher learning that need support at the most basic level — keeping them running, connected to networks and secure — is already enormous and multiplying quickly. More than 98 percent of U.S. undergraduates own a PC, and 38 percent of freshmen arrive at college with both a desktop and notebook computer, according to the “Study of Undergraduate Students and Information Technology 2006” by the EDUCAUSE Center for Applied Research.

Technologists as Evangelists

Call it educating or call it evangelizing, academic technologists often spend a lot of time and energy explaining, and even pitching, the potential of technology to faculty and administrators. Used most effectively, technology can both support and transform pedagogy, they say. IT staffs and academics who focus on learning and technology act as guides to that transformed educational landscape, and in doing so take on the accompanying worries about moving too fast or taking a wrong turn.

"Part of our job is helping the faculty connect with technology," says David Kahle, director of academic technology at Tufts University in Medford, Mass. "We actively partner with faculty to explore technology's potential for enhancing teaching and learning."

Kahle's department publishes a quarterly newsletter aimed at keeping the faculty abreast of technologies with potential value in the classroom or laboratory. It also organizes forums on technology topics and provides classes to faculty members so that they can use technologies themselves.

"We promote a discovery process which helps faculty identify applications of technologies that support their instructional goals," Kahle says.

Sometimes a more personal approach can work to interest a colleague in a technology, says Richard Ferdig, associate professor of educational technology at the University of Florida College of Education.

"As I find technologies that I think are interesting, I take them to people and just say 'here's something that might be useful to you' and let them explore it," Ferdig says. "We believe in the power and potential of technology, so why wouldn't we want to involve the faculty? Keeping your eyes open and sharing new technologies is an important part of it."

The barriers to persuading faculty members that technology can make their work easier and better are largely emotional, says Christopher Sessums, director of distance education at the University of Florida College of Education. Shifting the focus of the discussion away from software or hardware and toward teaching can help overcome those hurdles, he says.

"It's about people, not about technology. Technology can be a wall that scares them," Sessums says. "I ask, 'what does your ideal class look like,' and then I try to explain ways that technology can help get closer to that vision."

But not every technology has a place in academia, and the IT department has to be careful not to push too hard, says Wayne Brown, CIO at Johnson County Community College in Overland Park, Kan.

"There's a fine line between evangelizing and throwing solutions over the fence and wondering if they'll hit anything," Brown says. "Then you've got a solution looking for a problem, and that's not the way you should work."

Related to that misstep is another mistake that arises out of the enthusiasm IT specialists have for technology, and sometimes for its own sake rather than its usefulness, says Rick Ells, senior computer specialist at the University of Washington.

"You can spend a lot of your own time and other people's time with a gadget and not improve the quality of education a bit," Ells says. "Recognize what's not working from a teaching and learning standpoint and move on."

In a separate study published in December of last year, EDUCAUSE found that more than 88 percent of U.S. classrooms are equipped with wired Internet connections. High-speed network connections are offered in about 98 percent of all residence halls.

By last year, wireless Internet connectivity was available in 51.2 percent of all classrooms, and that figure was climbing fast, according to the "2006 Campus Computing Report" by the Campus Computing Project.

Add the databases dedicated to research results, courseware for faculty, multimedia applications for Webcasting lectures and myriad other pieces of hardware and software that saturate campuses, and the result is an extraordinarily rich technology environment. But because of that richness and complexity, the challenge of marshaling technology resources that effectively support pedagogy can be daunting.

In this white paper, technologists and academics from institutions around the country provide insights on how best to approach that challenge through strategic best practices and tactical initiatives. The underlying theme: In higher education, pedagogy must always trump technology.

"The bottom line is that [students] have to come out with more than exposure to interesting gadgets and applications, and they need to come out with a real education," says Rick Ells, senior computer specialist at the University of Washington. "We don't want them to look dumb at that first job interview."

1.

Expand IT services and provide easy, integrated access to them. At a very basic and substantial level, IT supports pedagogy by extending its reach while becoming increasingly invisible to users.

The key is to free instructors and students to teach and to learn, rather than to think about how to use the technology to get to resources, says Jack Drost, director of library systems at the University of Alabama in Huntsville.

"The theme of a lot of what we do is ubiquitous access," Drost says. "That means pushing the wireless network out to all of the campus, of course, but there's much more we do to make the lives of students and faculty easier."

IT staff at UAH are currently implementing a campuswide login system so that there is one access point for hardware, networks and applications. They are also building a portal to unify applications presently spread out and stovepiped in various departments and labs across the university, Drost says. E-mail, courseware, learning tools, library catalogs, the grading system used by faculty and many more applications will all be available through a single window on a "simple, clean" interface tool, he says.

"Students walk around campus with lists locations and passwords for resources, but soon that will be a thing of the past," Drost says. "That's not what they should be thinking about."

2.

Adopt a pedagogical framework and align your IT initiatives to it.

As essential as it may be to respond to the immediate needs of faculty and students, effective IT for higher education must have reference points in a larger context, says John Campbell, associate vice president for Teaching and Learning Technologies at Purdue University in West Lafayette, Ind.

The framework should firmly ground IT decisions in the knowledge of how they will affect teaching and learning at the institution, enable rational assessments of technology and provide goals against which progress can be measured.

Many colleges and universities, including the University of Washington and Purdue, use the "Seven Principles for Good Practice in Undergraduate Education," first proposed by Arthur Chickering and Zelda Gamson in 1986 (see sidebar on page 4). But the precise elements that make up the framework are not as important as the process of choosing it in collaboration with classroom instructors and working to realize its goals through IT, Campbell says.

"Pick some kind of framework and engage the faculty based on that framework," Campbell says. "We chose the Seven Principles because they're supported by some research and by common sense, but there are other good choices. We survey the faculty and students about how IT tools and services help teaching and learning specifically within the context of the framework."

Purdue adopted a clicker system in some of its classrooms as a way to provide prompt feedback to both instructors and students advocated by Chickering and Gamson. In much the same way, the university is rolling out Adobe Acrobat Connect, a Web collaboration tool, to support the goal of facilitating communication and cooperation among students.

"People learn to look at our IT services and ask which of the principles it supports and how well the service is doing that," Campbell says. "If we've got an application or a service that assists active learning, can it be better or is there more we can do with technology? Those questions keep pedagogy in the forefront."

3.

Forge communications links with faculty, students and administrators.

Just as in any business, academic IT departments need to listen and talk to their customers. It's impossible to support pedagogy without communicating with the people directly involved in the educational process.

The way to ensure that will happen on a regular basis is to set up formal mechanisms — meetings, committees and advisory groups. Casual conversation can be a great way to gather information and ideas and spread the word about technology, but IT staffs need a more reliable conduit to the people involved in teaching and learning, says Wayne Brown, CIO of Johnson County Community College in Overland Park, Kan.

"One of the first things I did when I got this job was to set up an academic advisory technology committee," Brown says. "There's a group of faculty and

The Future of Education Looks a Lot Like ... MySpace

There's a good reason that some instructors at colleges and universities are suspicious of technology — it could make them a lot less important in the future, says Robert McClintock, a professor at the Teachers College at Columbia University in New York City and former director of the Institute of Learning Technologies.

"The deep integration of the online environment with the teaching and learning mission of the university in the long run is likely to reduce the professor-centric quality of education," McClintock says.

It will take a while to see if that vision becomes reality, but in the meantime educational technology increasingly focuses on tools that enable networking and collaboration among students, among faculty and between faculty and students. Academics like McClintock and Richard Ferdig at the University of Florida are studying social networking software and how it might be used in — and change — education. IT departments at institutions of higher education are rolling out collaboration applications, wikis and any number of other tools that increase virtual contact among members of the college community.

"I do a lot of work on [social networking Web sites] Facebook and MySpace because that's the environment our undergraduates are coming from," Ferdig says. "That experience is going to shape their expectations of education and technology."

Students already use Facebook as a directory to find each other for academic projects as well as for socializing, says Dwight Fischer, CIO of Plymouth State University in Plymouth, N.H.

"The students want to network with the faculty and with each other and they want us to help them do it," Fischer says.

McClintock predicts that in the future networking boundaries will largely disappear. Education is moving to an online environment, and education technology is likely to be integrated into the public technology of the Internet, which, he acknowledges, raises some significant issues around privacy, security and intellectual property.

"Technology promises to open up education to more student input — more autonomy — and even to input from the public," McClintock says. "Top-flight IT organizations will, however, provide both the experimental online environment and support for more traditional pedagogy for some time to come. It might not be wise to maintain a single model at this point."

Seven Principles: A Sample Pedagogical Framework

In the more than two decades since Arthur Chickering and Zelda Gamson published “Seven Principles for Good Practice in Undergraduate Education,” their tenets have been adopted by educators at many colleges throughout the United States, including the University of Washington and Purdue University. The seven principles are listed below as an example of the kind of pedagogical framework that can provide context for IT initiatives.

Good practice in undergraduate education:

1. Encourages contact between students and faculty
2. Develops reciprocity and cooperation among students
3. Encourages active learning
4. Gives prompt feedback
5. Emphasizes time on task
6. Communicates high expectations
7. Respects diverse talents and ways of learning

The ideal framework is broad, philosophical and flexible, so that it provides some grounding in the fast-changing disciplines of education and technology, says Rick Ells, senior computer specialist at the University of Washington.

“Even as you look for ways to make things better, it’s valuable to understand that the basics of good teaching haven’t changed much,” Ells says.

administrators, along with two students, who meet with me and my staff and participate in technology decisions.”

The committee participates in every step of major IT projects, from early planning to implementation, and has real decision power, Brown says. Most IT initiatives only go forward after the committee signs off.

“They know what they need in terms of teaching, learning and administration, and I try to get them the information they need about technology so they can make informed decisions,” Brown says. “I want them involved in the request-for-information stage all the way to the final deployment decisions.”

4.

Find early adopters among the faculty and try out new technology in their labs and classrooms. Involving faculty and students in real testing of technology has both specific and far-reaching benefits, says Plymouth State University’s Fischer.

First, the practice provides answers to questions about the technology in real-world educational situations: Does it perform as advertised? How difficult is it for the instructor and students to use the hardware or software? Does it make education better?

In addition, a hands-on partnership with faculty members significantly tightens the connection between IT and pedagogy. The IT department, the educator and students share perspectives on the value of particular technologies. Those shared perspectives can lead to more general understanding of what’s needed to support and improve teaching and learning.

“There are always faculty members who are interested in new tools and new technology strategies — you just have to take the time to find them,” Fischer says. “There’s an intimidation factor with some faculty when they approach technology, and we as an IT department have to bring them along. The early adopters are more likely to see it as an adventure. It’s foolish to waste their knowledge or their enthusiasm.”

5.

Enable meaningful measurement in educational programs. Colleges and universities are not immune to the push for accountability that’s being felt at all levels of education. Trustees, parents, taxpayers, politicians, and even faculty and students themselves want to know what’s working in education and what’s not. IT departments, often in partnership with assessment specialists, are increasingly asked to collect, aggregate and analyze data that can be used to size up students, professors’ programs and entire institutions.

The best practice for those IT departments is to find and use the most sophisticated and flexible technology available so that the resulting measurements yield insights rather than snap judgments, says Robert McClintock, a professor at The Teachers College at Columbia University in New York City and former director of the Institute of Learning Technologies. And it’s possible for metrics to have immediate pedagogical value, which IT can help maximize.

“We assume that the measurement of performance informs the teaching process,” McClintock says. “We have growing capacity to provide feedback that would have been impossible for even the most diligent instructor in the past, so we should use it.”

Speedy and individualized reporting of results is crucial in order to use metrics to support teaching and learning, McClintock says. He advocates the implementation of embedded evaluation and feedback tools so that students and instructors can learn how they are doing in “close to real-time.”

Measurement is going to be increasingly important in the future, and that will be beneficial, says Purdue’s Campbell, who has done research and written about academic analytics. He offers a warning, however.

“The more we understand about our students, the better,” Campbell says. “We just have to be careful because data can be manipulated for political reasons.”