Electronic Portfolios May Answer Calls for More Accountability

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A decade ago, the Rose-Hulman Institute of Technology had a few simple goals. It wanted to sharpen its educational mission, broaden students' skills, improve graduates' job-placement rates, and give the institution better ammunition for proving its worth to accreditors.

It turned to the "electronic portfolio," becoming one of a small but growing number of institutions using an old idea — the long-term compilation of student classwork — in a new computerized format that lets Rose-Hulman directly score student performance campuswide on a list of specific skills.

And now, as the Bush administration and Congress press colleges to do more to prove their worth, the concept is being seized upon by institutions as a way to provide quantitative proof of how they help students learn while keeping the right to define their own missions.

"Electronic portfolios are a way to generate learning as well as document learning," said Barbara Cambridge, a co-director of the Inter/National Coalition for Electronic Portfolio Research, which organizes case studies by participating institutions. "And that's one of the most exciting things about them."

Hundreds of colleges use some type of electronic system for assembling and storing student work. But a few dozen, acting without federal direction and with little other outside coordination, have developed more sophisticated versions that guide assessment and curriculum development. They include both small institutions, such as Thomas College in Maine and Kapiolani Community College in Hawaii, and large ones, such as Minnesota's state colleges and the University of Washington.

It's not a simple or cost-free decision. Even supporters agree that making full use of electronic portfolios — computerized compilations of written assignments and exams, and even videos or artwork — can often be difficult, time-consuming, expensive, and fraught with frustration for faculty members and students, who may have to enter codes that indicate the portions of their work that satisfy various institutional requirements.

Some colleges "jump into them, [and then] they say, 'Oh my gosh, how are we ever going to manage or afford this,' and they back out of them," said Lynn E. Priddy, director of education and training at the Higher Learning Commission of the North Central Association of Colleges and Schools, one of the nation's six regional accrediting bodies.

As part of a well-designed program, however, an electronic portfolio can "really produce excellent information about what students are learning and how well," Ms. Priddy said.

An Early Adopter
The Rose-Hulman Institute, which is known for its undergraduate science and engineering programs, is one of the nation's earliest adopters of electronic portfolios and one of their most fervent advocates. The institute has designed three different versions of its own RosE Portfolio system over the past decade for its students to submit and store their class work and materials electronically.

Rose-Hulman's 1,800 students learn traditional technical skills in such subjects as chemistry, civil engineering, mathematics, and physics. The college has also established a series of "professional skills" it wants students to master in areas that include leadership, teamwork, communication, and ethics.

The process involves asking faculty members to consider all opportunities for incorporating those professional skills into existing courses. One assistant civil-engineering professor, James H. Hanson, asked students in his structural-mechanics class to consider ways of rebuilding New Orleans after Hurricane Katrina. But rather than calculate the optimal design for a new levee system, Mr. Hanson wanted his students to evaluate how various repair options might affect culture, economics, and public opinion in the storm-ravaged city.

At the end of each academic year, Rose-Hulman administrators gather faculty members who volunteer to work in two-person teams to review students' electronic portfolios and determine how well the college did in each of 25 separate criteria that define the desired professional skills.

Because the portfolio software allows students to flag the portions of their work that apply to each criterion, the faculty reviewers can quickly find only those portions of the assignments — perhaps as little as a sentence or two — that apply to the criteria assigned to their team.

The results allow Rose-Hulman officials to see how effectively the college is teaching each of the skills and to revise its approach as necessary as the college seeks to establish a unified campuswide vision of what a Rose-Hulman education means.

Before Rose-Hulman adopted its electronic portfolio system, in 1997, departments and faculty members pursued separate missions, said Arthur B. Western, vice president for academic affairs and dean of the faculty. They operated, he said, like "independent contractors connected by a common plumbing system."

Federal Pressure

Getting colleges to establish more systematic ways of setting goals and measuring their progress has been a key objective of Education Secretary Margaret Spellings. The secretary, in response to recommendations from her Commission on the Future of Higher Education, last year suggested a specific set of tests and other measures to judge and compare colleges. Under pressure from colleges, she later made clear that she believed each institution should define its own mission, as long as it developed clear methods for measuring that success.

Electronic portfolios give colleges that very opportunity, said Ms. Cambridge.

The tasks of setting institutionwide goals and overseeing faculty practices and curricula "are now more in potential for alignment than they probably have ever been," she said. "And part of that is because we now have the evidence that can be collected and shared in e-portfolios."

Electronic portfolios simplify the process of setting learning objectives and meeting them, said Peter T. Ewell, vice president of the National Center for Higher Education Management Systems. And as the advantages of electronic portfolios become clearer, he said, he expects more institutions to begin to use them.

Many already have. Institutions that use such systems as part of a comprehensive approach to measuring self-improvement include Alverno College, George Mason University, Indiana University-Purdue University at Indianapolis, and the for-profit, online Capella University chain.

Other colleges are trying it on a more-limited basis, such as within a particular academic discipline. Electronic
Portfolios are being used in programs of writing at the University of Georgia, psychology at Clemson University, and education at Virginia Tech and the University of Nebraska at Omaha.

Such colleges report various advantages of electronic portfolios, some of which mirror the reasons that elementary and secondary schools and colleges pioneered the use of paper-based portfolios to track student work a century ago.

In addition to the institutionwide benefits, research is suggesting additional direct benefits for students. In recent reports to the Inter/National Coalition on Electronic Portfolio Research, institutions describe the process of keeping a portfolio as fundamental for promoting in students deeper self-reflection and deeper understanding of their subjects.

Bowling Green State University submitted a report to the coalition showing that, on average, undergraduates using electronic portfolios had higher grade-point averages, credit hours earned, and retention rates than a comparable set of students who did not use the system.

LaGuardia Community College found that its students, about 70 percent of whom are immigrants, began writing their assignments with greater care and clarity, understanding that the electronic format meant family members in foreign countries might sometime be able to read them. "That taps into an intrinsic motivation" for students to submit their best work, said Kathleen Blake Yancey, an English professor at Florida State University who serves as co-director with Ms. Cambridge at the research coalition.

Portfolios of student work have long played a role in helping graduates find jobs in fields like art and engineering, and the ease of using an electronic version could help expand that use to other fields. A theater major at Winona State University, in Minnesota, helped himself win a human-resources job by including in his electronic portfolio a video of himself directing a stage rehearsal to show his management skills, Ms. Cambridge said.

At least two institutions, Florida State University and the University of Waterloo, in Canada, ask prospective employers what skills they would like to see reflected in an electronic portfolio presented by job applicants so the institutions can incorporate that information into their designs, she said.

**Colleges Doing It on Their Own**

Much of this work is being done at institutions without help from the federal government or outside groups. The Spellings commission, while recommending colleges adopt standardized tests or measures such as the Collegiate Learning Assessment and the National Survey of Student Engagement, never mentioned electronic portfolios in its 76-page final report in 2006.

The commission's chairman, Charles Miller, said he would want colleges using electronic portfolios to also use a common tool like the Collegiate Learning Assessment but agrees that the portfolios could be a valuable additional method for a college to prove its worth. It "could be a revolutionary thing," he said.

It wasn't until last fall that the U.S. Education Department announced its first expenditure related specifically to electronic portfolios. The department is giving $2.4-million for national college associations to study various assessment tools, with about a third of that money devoted to electronic portfolios.

The electronic-portfolio part of the study is being handled by the Association of American Colleges and Universities, which plans to compile a list of the most commonly used criteria in areas such as writing, oral communication, and critical and analytical thinking, and then test the use of those criteria at a group of 12 colleges.

In the meantime, colleges and their accreditors are moving ahead — and businesses and other groups are beginning to crop up to help them. Several colleges are working with the Minnesota-based eLumen
Collaborative to develop a system that goes beyond the electronic portfolio model by having professors record their assessments of student performance based on institutional criteria, rather than ask the students to code their own work. Liaison International, in Massachusetts, is developing a product to help colleges present their performance data to accreditors. Accreditors such as the North Central Association and the Western Association of Schools and Colleges have been helping both their member institutions and their own program-review officers understand and use electronic portfolios.

Obstacles remain to making electronic portfolios work smoothly. Even at Rose-Hulman, barely half of faculty members require their students to participate in the RosE system. Some professors abstain because they prefer to use paper and blackboards, while others are so technologically advanced that they have developed their own Web sites and aren't eager to make them conform to the university's system, said Julia M. Williams, the college's chief of planning and assessment.

Such experiences may be daunting for other colleges, given that Rose-Hulman's faculty and staff members and students have spent incalculable amounts of time and money developing the process. University officials said they would not offer even a ballpark figure of the total cost, in part because of nondisclosure agreements they signed with software companies that helped them build their system.

"It takes deep understanding on the part of the administration, a willingness to experiment and innovate on the part of the faculty," said Ms. Priddy, whose commission accredits Rose-Hulman. "And, many times, lots of money."

In structuring its portfolio system, Rose-Hulman began knowing what it hoped to accomplish and then built the technology to fit it, Ms. Priddy said. Too many other colleges are starting out "using technology in search of a problem," she said. Colleges motivated more by a desire to show results externally, rather than promote positive change internally, will probably end up paying for a system that produces only limited benefits, Ms. Priddy said.

**Practical Uses**

Joel M. Anderson, who graduated from Rose-Hulman last year and now works as an apprentice structural engineer in Arizona, has a sense of what a well-designed electronic portfolio system could mean for students.

When Mr. Hanson, the engineering professor, gave his junior-year class the Hurricane Katrina assignment, Mr. Anderson found it bothersome.

"The course alone didn't necessarily need to have anything to do with ethical questions," recalls Mr. Anderson, who works for HDR Inc. in Phoenix. "I guess as a student, I was a little bit annoyed that we had to do this work that didn't seem to have too much to do with the course."

Mr. Anderson and other students also say they were troubled, especially in the early years of the RosE system's development, by having to tediously code passages in their class assignments so that faculty members could track the criteria they evaluate at the end of the year.

But now that he has entered the job market, Mr. Anderson says he understands that Rose-Hulman was trying to promote qualities such as leadership, teamwork, and ethical decision making that can help him in his career just as much as his ability to calculate the strength of a levee in New Orleans.

Among Mr. Anderson's biggest regrets now is that the electronic-portfolio system wasn't more developed by the time he graduated. Many engineering firms around his hometown, near Indianapolis, would only hire civil engineers with master's degrees, forcing him to find his first job more than 1,700 miles away. If he had had an electronic portfolio in a format that could have been presented to a prospective employer, he believes he could have proven himself as talented as a candidate with an advanced degree, and might not have had to leave his home state after graduation.
"There's a possibility that if recruiters were familiar with this e-portfolio system and I showed it," he said, "then maybe they would have looked more at it."