



TEACHING & LEARNING

By Susan Walsh Veronikas
and Michael F. Shaughnessy

in a Hybrid World AN INTERVIEW WITH CAROL TWIGG



Dr. Carol A. Twigg is Executive Director of the Center for Academic Transformation at Rensselaer Polytechnic Institute. The mission of the center is to serve as a source of expertise and support for those in higher education who want to take advantage of the capabilities of information technology to transform their academic practices. The center manages a program in course redesign and a symposia series, both focused on improving student learning and reducing instructional costs.

From 1993 to 1998, Twigg served as Vice President of Educom, one of the precursors to EDUCAUSE. At Educom, she founded the National Learning Infrastructure Initiative (NLII) and initiated the IMS (Instructional Management Systems) project. Before joining Educom, Twigg served as Associate Vice Chancellor for Learning Technologies for the State University of New York (SUNY) and as Director of the Center for Learning and Technology and Associate Vice President for Academic Programs and Information Technology at SUNY–Empire State College, SUNY’s college without a campus.

Twigg has published and presented widely on such topics as improving productivity in higher education, engaging faculty in the use of instructional technology, and managing information technology in a distributed environment. In 1995, she was named by *Newsweek* as one of the fifty most influential thinkers in the information revolution, and in 2003, she received the Harold W. McGraw Jr. Prize, awarded to individuals making a difference in education.

Recently, **Susan Walsh Veronikas** and **Michael F. Shaughnessy** talked with Carol Twigg about her work in course redesign and her thoughts about learning objects, online standards, and the educational market, among other topics.

Susan Walsh Veronikas is the educational technologist at Clovis Community College and a doctoral student in Instructional Technology at Texas Tech University. Michael F. Shaughnessy is Professor of Special Education at Eastern New Mexico University and Director of the New Mexico Educational Software Clearinghouse in Portales, New Mexico.

Q: You have been an influential thinker in the field of information technology and higher education. Who, in turn, has influenced you? Who would you name as your mentors?

Twigg: The most important influence on me has been Bob Heterick, the former president of Educom. He was an outstanding figure in the field of information technology for his entire career, and he was the one who hired me to be vice president of Educom. He was a tremendous influence on me in thinking about applications of technology, in understanding the world of technology, and in gaining confidence in all the things that I’ve done. Of the many interesting people I’ve met in the course of my career, Bob was head-and-shoulders above anyone else.

Q: What are you currently working on?

Twigg: A combination of several things. First, we’re doing a final analysis of the results of the Program in Course Redesign, which the Center for Academic

Transformation has been conducting for the last four years. We have already done a full analysis of the first and second rounds, and we're assembling the results of the third round, for which we'll do a similar analysis. We have also recently launched the Roadmap to Redesign, the next phase of the program. We received a major FIPSE grant to support this next phase, in which we'll work on accelerating the diffusion of our redesign methodology over the next three years. We are also engaged with a number of states, systems, and institutions to help them develop their own course redesign programs.

Q: Has your experience in course redesign led you to any conclusions about whether we in higher education have used technology inadequately, improperly, or inappropriately for helping those students who are unprepared for college or university work?

Twigg: I don't think we've come even vaguely close to realizing the potential

that's there for unprepared students. From our experience in the redesign program, we know that using technology, particularly for disadvantaged students, can produce tremendous gains in student learning. It's pretty clear to me that one of the reasons for such high failure rates in freshman courses—rates that get worse when you move from the research university to the comprehensive university to the community college—is that old methods of teaching and learning, like faculty members who just stand up and talk at students, simply don't do the job. So I think there's tremendous potential for using technology effectively for remediation purposes.

Q: Where has higher education missed the mark in terms of ensuring that students have the proper prerequisites for classes, that they have the proper background knowledge?

Twigg: I guess the way I would interpret this question is that in my view, higher education is insufficiently focused on learning

outcomes. That observation is becoming pretty much a cliché these days. But even though everyone's talking about it, few are doing anything about it. If institutions and the developers of individual courses were clearer about what students are expected to achieve in terms of outcomes, that would necessarily lead to greater clarity about whether or not students are ready to move on to the next course in the sequence. If we're not clear about the outcomes required of students when they leave higher education, we're going to have problems at each stage along the road because we will not be certain that students have the necessary prerequisites to move forward. I think a greater focus on learning outcomes and competencies would lead to greater clarity about prerequisites.

Q: Most tutorial programs are skill-and-drill. Would you consider these types of programs learning objects?

Twigg: I don't understand this question. I'm not sure I agree that most tutorial pro-

grams are skill-and-drill. *Learning objects* is a term that means a lot of different things. Sometimes drilling is useful depending on the subject matter.

Q: How would you define *learning objects*?

Twigg: I understand learning objects as pieces of learning materials that can be mixed and matched to create a learning experience for students. A learning object could be a simulation in chemistry or an exercise in mathematics or an assessment in fine arts. The notion is that you can take pieces at different levels of granularity and put them together to create a learning experience. Tutorial programs certainly are part of that mix. There are good and bad tutorial programs, and there are good and bad learning objects out there. There's no question about that. So I wouldn't want to generalize about tutoring programs. Carnegie Mellon, for example, has created an AI-based tutoring program—"StatTutor"—that is certainly highly sophisticated and highly effective, but it isn't characteristic of all tutorial programs.

Q: Where do you see learning objects being appropriately used in higher education?

Twigg: I think the whole topic of learning objects is currently being overhyped and misunderstood. MERLOT is a good example of this. MERLOT claims to have 7,000 or so learning objects in a database. But if these learning objects haven't been evaluated in terms of whether or not they increase student learning, you then just have 7,000 sort of mildly interesting things collected in a database. We need to be much more aggressive in evaluating learning materials in terms of the impact they have on students. In other words, we need much more research-based evaluation. The degree to which materials have been tested with large numbers of students will determine whether they can make a real difference in student learning. I think learning objects have a tremendous role to play in education, but simply collecting individual faculty members' favorite things is not getting the job done.

Q: We like your word *overhyped*. Would you say that technology and computers

have been overhyped in terms of their use in education?

Twigg: Oh, no. I think they've been underhyped.

Q: Underhyped?

Twigg: Yes. The potential to make tremendous differences in the way in which we conduct education at all levels is absolutely enormous, and I think most people in education don't have a good sense of that. They get very excited about e-mail or the Web, and they say this or that is a be-all and end-all of using technology in education, but we're really just scratching the surface of what's possible.

Q: If that's true—if technology is being underhyped in education—who isn't taking the leadership role?

Twigg: The main problem lies with academic leaders—be they administrators or faculty members. Technology people in

higher education are very well-meaning people. They really want to support faculty and students. But they are support people. We need leadership to come from the academic side—leadership that says, "These are our academic goals for the use of technology" rather than "Let's find ways that we can get the faculty to use technology." To the degree to which academic leaders are clear about what they're trying to achieve, technology can be a tremendous enabler to help them do so. But if you're just kind of fuzzy about what you're trying to achieve with students, you're not going to get very far.

Q: What standards should online courses follow?

Twigg: That's another rather general question. Do you mean technological standards, academic standards, standards of good practice?

Q: All of the above. And who should oversee these standards?

Twigg: Academic standards for online courses shouldn't be much different from the standards for face-to-face classes. In other words, those responsible for quality preservation should focus on face-to-face classes *and* online classes. There shouldn't be any distinction between the two. I think the need for technological standards that create real interoperability in online courses is a very important issue in higher education, and standards groups like the IMS project are working in that area.

Q: Should there be a national accreditation body for online classes?

Twigg: No. Absolutely not.

Q: Do you want to let individual faculty and colleges and universities handle it?

Twigg: My main point is that there should not be two standards. So if you think there ought to be a national accreditation body for *all* courses, that's great, but we

shouldn't single out online courses. Our current accreditation is based on regional accreditation, and as long as that's the case, I think regional accreditation should include online courses as well as face-to-face courses. But I don't think there should be two separate standards. It makes no sense to me.

Q: Generally, students need education beyond high school to find employment. How do you see the educational market meeting these needs?

Twigg: One of the problems that American higher education faces—and it's a severe problem—is that it can't meet the enrollment demands of students. Close to 70 percent of high school students are going on to college these days, and of course older adult students are a huge aspect of the higher education market as they return again and again to higher education to upgrade their skills and gain new knowledge in order to compete in the new economy. So I think

the problem is how to meet that demand in an effective way. One of the reasons I'm interested in the whole notion of redesign using technology is because I think that by simply bolting technology on to an existing structure, we're never going to make the changes needed to meet that kind of high student demand. A crucial issue for higher education is finding ways to use technology so that we can expand access and serve greater numbers of students more effectively.

Q: It's well known that education falls behind business in adapting to the needs of a global economy and that a lot of students graduate unprepared for the job market. What kind of structural changes should higher education be making to reverse this?

Twigg: The most important factor is having closer ties with the world outside of academia, and that gets expressed in different ways depending on fields.

People in business and engineering, fields that are professionally inclined, tend to have closer ties to the world of work. Their programs are more often developed with a link to what students are doing on campus and what students are going to be doing once they leave campus. But it's important for all aspects of colleges and universities to have that relationship. The liberal arts field needs to have some real understanding about the impact that liberal arts preparation has on students as they go into the world of work. Colleges and universities are very fond of claiming that having a liberal arts background is very important when a graduate gets into the world of work, but there's not a lot of evidence that this is the case. Finding out how to make those linkages more concrete will benefit both the institutions and the employers.

Q: Do you favor the competency approach over traditional methods of evaluation?

Twigg: I do—in a kind of modified format. I worked at an institution that didn't give grades and that did everything based on narrative evaluations and student competencies. Trying to sort out all the competencies and capture them in narrative form often became a tremendous bureaucratic hassle. But the developers of courses and programs do need to be clearer about the competencies they are asking students to acquire and then need to be clearer about the way students should express the attainment of those competencies. This needs to be done in the most streamlined way possible. There are many competency-based institutions where you practically have to read a book in order to understand a student's records. So I certainly favor competency approaches that are conducted in a way that's expeditious for all concerned.

Q: As a delivery method, online education has been criticized by traditional faculty for not really educating students. And online work is not accepted as a credible course of transfer at some institutions. What could or should we be doing to correct this?



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Twigg: I don’t think that’s an issue anymore. It was an issue ten years ago, but with the tremendous growth of online learning, just about every institution in the country is involved in online learning in some way or another. I think this issue is fading away. Those faculty who still worry about the quality of online education or have some notion that it’s not as good as face-to-face education simply need to gain experience, either by teaching an online course or by talking to their colleagues who are engaged in online teaching. Experience is really the best teacher. It has led to the steady evolution of online learning over the last decade, and I think that trend will continue to accelerate.

Q: Technology training is required in many K–12 public schools for both students and instructors, but this policy is not followed in higher education. Faculty are often less technologically proficient than students. What should academic institutions be doing to meet the growing demands of a generation that expects technology and media as part of the educational environment?

Twigg: That’s also changing. If you had asked me this question ten years ago, I’d be shaking my head and saying: “Oh my God. Where is this going to go?” But now, even my favorite English professor from my undergraduate days is using a computer, and he always swore he never would. There is a lot of change going on in higher education.

However, it’s probably not sufficient to keep up with the changes going on in society. Young people use technology in ways that I don’t think college faculty are ever going to be comfortable with—for things like instant messaging—and that’s OK. I don’t think we need to do everything oriented toward student culture; part of the idea of the college/university experience is that students are making a transition to a somewhat different world. But having said that, I do think that most institutions are aware that using the In-

ternet, using the Web, benefits students and benefits faculty and benefits the institution, and so they’re taking steps to support faculty and staff in making those kinds of changes.

Q: Any advice for the faculty member who is struggling to teach five classes, supervise master’s theses, and serve on ten committees? How do we also keep up with the rate of technology change?

Twigg: The first advice I would give is not to try to do it alone. One of the things that we’ve promoted very actively in our program is that faculty should collaborate and work with each other. Faculty members sometimes feel that they’re sort of an island unto themselves and that they’re supposed to master all of this independently. The degree to which you can share preparation, share material, and share resources with colleagues makes a tremendous difference. My second piece of advice is not to feel like you have to be aware of the latest thing, because it really isn’t all that important. It *is* important to know what has sustainability and what will stick around for a while.

As an example, ten years ago people were asking, “Is the Internet going to be more important than satellite television or handheld computers?” Think about all the technological options that were available then; those options get more and more varied as the years go by. So you have to pay attention to what you think is going to be sustained and put your efforts there. It was very clear to me that the Internet was going to be the most important technology, so that’s where I devoted my attention. Just try not to get led astray by the latest thing.

Q: So faculty need to be prudent and judicious in terms of whether to adopt Blackboard, or eCollege, or some other of the various platforms?

Twigg: The decisions about platforms

should be made by the IT staff, in consultation with faculty. That’s why you have IT staff—so that faculty don’t have to pay attention to all those details about which platforms are going to last the longest or be the most beneficial for your campus. A lot of faculty make the mistake of thinking that they have to be technological experts. I know a lot about technology, but I’m not even vaguely knowledgeable about the details that a good IT staff person will know about. So I’d say: rely on the people in your IT department, and if you’re not happy, then go find new ones, because that’s what their job is—making sure that you don’t have to worry about that level of detail.

Q: Leaders in the field of technology have suggested that experts or professors at the top of their field should be designing the content of online classes. Are these experts the best instructors?

Twigg: The way that issue generally gets expressed is that professors are experts vis-à-vis the content but that instructional designers and others should work on other aspects of the course. I think the biggest problem of faculty is that they may be experts in their subject matter, but they’re not necessarily experts in learning theory. So we need to pay closer attention to the ways in which students learn and to how technology can be useful in assisting in that process. Again, faculty shouldn’t try to do this by themselves or think that they’re the be-all and end-all in terms of their own expertise. They should collaborate with others, because a tremendous amount of learning can result when those collaborations occur. Most of the faculty members who have trouble with online learning are those who try to do it all by themselves. They experience the phenomenon of “I’m teaching an online course, and I get 200 e-mails, and I have to respond to everybody.” It’s when they try to do it all by themselves that they run into problems.

Q: What do you see as the role of “hybrid classes”—those that have at least 50 percent of the coursework online?

Twigg: It’s a hybrid world, you know. Students, faculty, all of us live in a face-to-face world and in an online world. That’s part of the impact of technology. So I think the notion of mixing face-to-face learning with online work makes a tremendous amount of sense. My one caution is that people seem to be getting a little fixated on this and saying there’s a perfect formula, a kind of 50/50 match. In some courses it may be more like a 90/10 match and in others a 60/40 match. We have to look at what we’re trying to accomplish in a particular course and figure out the right blend of face-to-face and online. That blend is going to vary from subject to subject and particularly from student to student because students are quite different in their needs. But I think that hybrid courses are very definitely the way of the future.

Q: Online education could provide many students with a way to fulfill their general education requirements and degrees. Should online education be used in all disciplines—including medicine, engineering, nursing?

Twigg: I think it should be used in all disciplines if used appropriately. When I became interested in computer-based instruction in the early 1980s, the first example I saw was a videodisc. You remember those things? They were sort of the predecessors of today’s DVDs. They were huge, and they cost a fortune. This one was used in gastroenterology, and it was designed for medical education, to help students diagnose particular medical problems. The students would interview a patient and make different treatment choices. If the patient died because of a misdiagnosis, the students would learn from that result. The videodisc was seen as an excellent supplement to hands-on medical education. So I think that in every field, there are as-

pects that will benefit from moving the content online. But in most fields, there are going to be aspects that will benefit from face-to-face and hands-on experience. Here is another example. In our program in course redesign, we were eager to have representation from all disciplines because we didn’t want people to think: “Oh, computers are fine for math and science courses, but they won’t work in the humanities.” So we have humanities courses, math courses, science courses, and social science courses, among others, in the program, and we are trying to demonstrate that you can move across the academic spectrum.

Q: Should students be consumers or learners? What obligations do we have to society to ensure that kids are able to read, write, spell, and do math as well as insert intravenous tubes or perform medical surgery?

Twigg: I’m not an either-or kind of person. Students have to be both consumers



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and learners. I think we have an obligation to our students to help them learn, and obviously, being able to read, write, and do math is pretty important. Yet at the same time, students are increasingly consumer-focused. They are interested in how well their educations map to their future careers. It's up to us—and we're in a good position to do this—to mix the two ideas together. We need to be able to explain to students that if you can't write and if you can't communicate, you're going to have a hard time, regardless of how professionally oriented your goals might be. And it's also up to us to remind students that there's more to life than work—there is culture, there is art, there is history—and that it's important to be well-rounded human beings. So I think that rather than creating this dichotomy of consumers vs. learners, higher education needs to step back and find ways to bring those two ideas closer together.

Q: A lot of instructors do not teach online because they believe students will cheat. They have no way to verify that the student enrolled is the one doing the work or whether it's the wife or the husband or the significant other. Are these perceptions valid?

Twigg: Again, this is a product of lack of experience. There are various ways to deal with academic dishonesty. Students can be required to go to a proctored-test situation, at an on-campus or nearby location if students live close to the campus, or reliable professionals like local ministers can proctor an examination. That's one technique. Other techniques have to do with relying on different kinds of evaluations. In other words, instructors can require much more project-based kinds of measures to match a sense of what a student is like and how the student is performing in the course to the final evaluations. The concept that instructors won't know who the students are in online courses stems from the mistaken idea that if you're at a distance, you can't pos-

sibly get to know your students. Well, thousands of online courses have shown that this is not the case, that you can get to know students even better than you do in a face-to-face classroom. So I think these problems can be worked out. Again, the solution is going to vary depending on the subject matter and the students.

Q: Many online instructors express concern about students who procrastinate, waiting until the last minute to submit materials, assignments, and questions. Any advice?

Twigg: Oh, absolutely. This is one of my favorite topics. For some reason, people have gotten obsessed with the notion of self-pacing as being equivalent to online education, and that's probably one of the deadliest mistakes anyone could make in offering an online course. One of the most important things in the design of any course is creating sufficient structure—sufficient milestones for students so that they know they're making progress. And a successful online course needs to be very clear about that. The course needs many deadlines so that students don't have an opportunity to get behind. Students will procrastinate. I procrastinated in college and did all my papers the night before they were due, and I was a pretty good student. So I think that part of the key to dealing with procrastination is breaking down the course into smaller pieces and having frequent deadlines so that the whole phenomenon of procrastination can't get a chance to build up.

Q: Has education shifted from a traditional lecture mode to a learning-centered mode in the last ten years?

Twigg: No, it hasn't. I wish it had. The lecture is alive and well on most college and university campuses. The goal of the Program in Course Redesign is to encourage that shift away from stand-up

lecturing and toward a focus on active student learning. But our redesign program is in the minority vis-à-vis what goes on at most campuses. What makes anybody who's interested in student learning shudder is thinking about these highly equipped PowerPoint classrooms that enable faculty to continue to stand up and talk to students, albeit in a more interesting format. That is not an appropriate use of technology. Moving students into an active role is more important, and I think we have a lot of work to do in that area.

Q: What's the best alternative to PowerPoint?

Twigg: All of our redesign work focuses on students being actively engaged in the work. My favorite quote is from one of our math professors: “Students don't learn math by listening to other people talk about doing math; they learn math by doing math.” It's a simple concept. Anytime an instructor uses PowerPoint, he or she is basically standing up and talking about doing math. The idea that students need to be confronted with math problems and to work on those problems, alone or together with other students, has nothing to do with PowerPoint. And that's also true in a fine arts course. Students engaged in a fine arts course are going to be viewing works of art, reading about works of art, conversing with other students and faculty members about their ideas, and writing papers about them. That has nothing to do with PowerPoint or presentations. If you think about using the Web, with all its rich materials, and going out and seeking different kinds of resources that can be brought to bear on the problems you're helping students work on, that's a very different use of technology. Students are being active learners—actively seeking solutions to problems—and that's quite different from sitting back and watching someone put on a show. There are a lot of faculty who

think that you have to teach by presenting or performing, but that's not the way students learn.

Q: What should be the main focus of educational reform?

Twigg: It needs to have a dual focus: improving the quality of student learning and reducing the cost of instruction. Too many students wash out of higher education. As a society, we can't afford that. So we need to focus on student achievement. We also need to focus on controlling the rising cost of higher education because if costs continue to increase, students are going to be priced out of a college or university education. We're already beginning to see some of those strains in higher education. So, thinking about cost and quality hand in hand needs to be the major focus of reform.

Q: The majority of colleges and universities today are under stringent budget cuts, with minimal faculty hiring, and stu-

dents are taking on the burden of meeting institutional costs through rising tuition. Where do you see students turning to get an education without sinking into debt to meet the rising educational price tag at the local college or university?

Twigg: I think this is the main problem that we face in higher education. Part of the problem is that there isn't a good alternative for students. People in higher education are worried about competition from the private sector, but generally the private sector is going after the students who can afford to pay private tuition. And so that is not a solution for most students in public education today. This is one reason why it is absolutely imperative that we in higher education start to think about how we can redesign what we're doing so that we can have an impact on these rising costs. Otherwise, we're facing a severe national problem—one that is coming to the attention of Congress now in a much more aggressive way because we can't simply keep going as we have in the past.

Q: What do you see in the future for technology in higher education?

Twigg: I am encouraged because I think that people are getting over their infatuation with technology and are starting to think more seriously about how it can be used to make a real difference in student learning. Once we start to do that, the sky's the limit. So I remain incredibly optimistic. *e*

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