

Speaking of

Teaching



THE CENTER FOR TEACHING AND LEARNING • STANFORD UNIVERSITY

Interdisciplinary Teaching and Learning: A Panel Discussion with Stanford Faculty

This newsletter is dedicated to the issue of interdisciplinary teaching and learning. Thinking and teaching across the disciplines has long been an honored tradition at Stanford. In fact, the university's first interdisciplinary program was established in 1947. More than a thousand faculty members are currently affiliated with one or more interdisciplinary programs (IDPs), and together, these faculty members have created a rich web of scholarly thinking that has contributed significantly to the learning experiences of Stanford students, a quarter of whom graduate with an interdisciplinary major or minor. Recently, several multidisciplinary initiatives—among them the Arts Initiative, the Bio-X Program, the Initiative on Environment and Sustainability, and the International Initiative—have been launched to meet President Hennessy's call for the creation of new knowledge that responds to global challenges.

As a way to foster a discussion about interdisciplinary teaching and learning at Stanford, CTL dedicated a panel discussion to this topic at the Celebration of Teaching event in May 2006. Four panelists were invited to respond to one or more of the following questions: What is interdisciplinary thinking? How does interdisciplinary

research inform teaching? What kind of student work does interdisciplinary teaching and learning produce? What are the pressing questions for you or for Stanford?

In this newsletter, we offer highlights of the comments by **Professors Harry Elam, Pam Matson, Penny Eckert, and Eric Roberts** to invite a discussion about interdisciplinary teaching and learning, and to reflect a range of views that are just as varied and diverse as the intellectual approaches that emerge from interdisciplinary scholarship.

Panel Highlights

Harry Elam, the Olive H. Palmer Professor in Humanities and Chair of the Drama Department, explained how team teaching encourages professors to "step out of [their] comfort zone." He pondered what different models of interdisciplinary teaching work well. Not only does research inform interdisciplinary teaching, but to what extent are new practices, spear-headed by students, already transforming the process of interdisciplinary or multidisciplinary thinking?

"I throw this out as a question.

Is there a way that a solo person teaching a course can do interdisciplinary teaching? My wife and I now teach an IHUM course together and one of the things that students like is the point of disagreement. Team teaching takes more time. And it takes an investment both in terms of time and resources. You can't just appropriate the material. You have to think about it in a way that the other person coming from a different discipline is getting at it. So, you have to deal with them, with it, in a variety of ways. This sense of team teaching, in terms of interdisciplinarity, is something that forces you out of your comfort zone. Within that comes the question of how many faculty want to step out of that comfort zone, and how productive it can be in terms of the classroom environment. My sense is that it is incredibly productive and fun, and a learning experience, not simply for the students, but also for the faculty engaged."

"One of the things that team teaching does, too, is open up different assignments and different potential for solutions, be they group projects or other projects that somehow ask students to approach a subject differently. The [group] projects produce some form that incorporates all the things that have

happened within the course and tries to get the students to think about them differently.”

“One [model of interdisciplinarity] is what I would call the model of theory in practice, which happens in our department specifically, but also happens in the arts across the board at Stanford.

“Students become, in some ways, the resource. They become the thing where you see interdisciplinarity because they’re doing it in a variety of different ways.” Professor Harry Elam

In our department, we are looking at how the scholarship in performance works together with practice [and how] one informs the other. When you’re doing scholarship on a play, thinking about it, interpreting it, how is it informed by seeing that play in practice? That is a process which is, in ways, interdisciplinary. And that is something that often takes you working with someone else or working and thinking about the process differently.”

“One of the things that has changed interdisciplinary research is the power of the Internet, technology, the sense that lines are blurred in terms of what’s open and what’s available. How does that come into the arts? One of the ways, particularly at Stanford, that we can see things happening is something like the new design center—with engineering, with architecture, coming into drama in terms of stage design. There is a space for shared communication and a space for looking across at how the visual can inform the idea of what each of these fields do. ...In the Drama Department, we did a production with the dance division, something called Spring Migration, and the lights were done by an engineering student. They were just incredible, incredible what this student did. The magic you can see [is] that the training that he got in

one [field] came together with the training he got in another. Students become, in some ways, the resource. They become the thing where you see interdisciplinarity, because they’re doing it in a variety of different ways.”

Pam Matson, the Chester Naramore Dean of the School of Earth Sciences, the Richard and Rhoda Goldman Professor in Environmental Studies, and Senior Fellow at the Woods Institute, drew on her interdisciplinary research experience as a point of departure to reflect on how to teach students new ways of thinking across disciplines. She suggested that the principles that hold true in research could also inform interdisciplinary teaching. What concrete examples work well in demonstrating the process of interdisciplinary thinking?

“One of the challenges is...to make sure that we are actually bringing the students into the opportunity to learn the language, the assumptions, the tools, and the approaches, and to respect the different ways of looking at particular issues.” Dean Pam Matson

“The things I learned in interdisciplinary research hold for teaching as well. I think the first absolute is, if you want to do interdisciplinary research successfully, there has to be among all

the players respect, respect for multiple perspectives, multiple ways of knowing multidisciplinary insights. We found it very important over time, not to privilege one discipline over another. We realized that interdisciplinary research takes a lot of extra time because it takes time to understand the language of different disciplines. It took me about a year to realize that economists and ecologists use the term productivity in completely different ways and that it matters to how we talk to each other, learn the tools, and understand the assumptions that underlie the different disciplines’ research approaches and the perspectives they bring. So, all of those things I think are true in interdisciplinary research, and I think they’re also really true in teaching. One of the challenges is to find the time and to make sure that we are actually bringing the students into the opportunity to learn the language, the assumptions, and the tools and the approaches, and to respect the different ways of looking at particular issues.”

“[What] has been very useful for me is to illustrate the multiple perspectives in the process of teaching, and you can do that through team teaching. One of the first experiences I had in team teaching was at UC Berkeley with a sociologist before I came to Stanford—

and you know I’m a biogeochemist—and we were teaching an environmental problem-solving course. It was so exciting to realize that we saw the world completely differently and neither of us

had really understood each other's perspectives. We played this out in front of the students, which was incredibly frightening for them especially in the first year. By the second year we taught it, we had calmed it down a little bit, but basically what we were doing was showing the multiple perspectives in our teaching."

"Team projects are another way to go about doing [interdisciplinary thinking], asking each of the students to bring to it different perspectives, different world views, and different knowledge bases. I think that case-based education works really well, where you start with a problem, or an issue, or a question, and encourage the teams to explore the perspectives and the assumptions around that issue. So again, I've taught environmental problem-solving courses where you really explore issues from multiple points of view, and the students, as being part of that exploration, began to frame the issue not as a black and white issue, but as one that has many different levels of gray. And [the students] began to realize that they needed to understand those different levels of gray if they were going to actually work through the problem."

Penny Eckert, *Professor of Linguistics and Director of the Program in Feminist Studies*, found that the often challenging conversations among faculty from different disciplines informed the basis of her interdisciplinary work. She pondered how students can arrive at a kind of thinking that integrates different disciplines. Don't students first need to learn the language of the disciplines before they can begin to think in interdisciplinary ways?

"Interdisciplinarity for me was something that entered when I started pushing up against the bounds of my own research. My own life-changing interdisciplinary experience was at a research institute that was self consciously interdisciplinary. At first, we couldn't figure out how to talk to each other. There

were computer scientists, psychologists, linguists, and anthropologists. So, what we did was to start a seminar and talk about the relation between the social and the cognitive when you are thinking about, for instance, learning. Of course, the split between the social and the cognitive sciences is where my interdisciplinary passion lies. Each person would assign a reading in their discipline, and we would all read this work. Then we would sit down and discuss it. Ultimately, what we had to do was come to terms with—in your discipline—what constitutes a question, and what constitutes an answer to that question, what counts

that students really aren't that clear about what the various disciplines do. What students really need to know is what a discipline is. I suggest that departments ought to be rethinking how they teach their introductory courses because people know what the subject matter is—like a literature course is about literature—but what is the practice that makes it a discipline? What did the discipline arise around? What are the questions that get asked? What kinds of answers do people look for? Who are the players?"

"I would encourage departments to provide a more disciplinary education, but then the question is: Do we want interdis-

"It turns out that students really aren't that clear about what the various disciplines do. What students really need to know is what a discipline is."

Professor Penny Eckert

as an answer to that question, and then what counts as an argument. It was really through fighting our way through these texts in all of these different disciplines that we actually got to a point where we could talk together about a new way of thinking of learning."

"When I think about interdisciplinary education at Stanford, and particularly about the fact that this all has to happen in four years, I think that good interdisciplinary education has to begin with good disciplinary education. I direct an IDP, and so I am constantly engaged in trying to make interdisciplinary education happen. One of the things that always surprises me is when the students show up to plan their major. In Feminist Studies, we make every student have a focus—usually some issue—and then they build their major around it. We sit down and we say, 'Well, what disciplines are currently the ones that you think are most relevant to your problem?' It turns out

disciplinarity built into that? Or, do we want to leave the IDPs completely responsible for interdisciplinary stuff? I would guess the former rather than the latter. I would say, certainly, it would be a good idea to think about how you provide support for the IDPs, which are the main locus for the interdisciplinary teaching in this university."

Eric Roberts, *Professor of Computer Science and the Charles Simonyi Professor in the School of Engineering*, teaches interdisciplinary courses as a way to help students think outside of the box. He asked what professors can do to encourage complex thinking in light of the fact that students often see themselves as "fuzzies" or "techies," and therefore may be reluctant to cross disciplinary boundaries.

Talking about an introductory

freshman course he taught with then Vice Provost for Undergraduate Education Ramon Saldivar years ago, Professor Roberts described his reasons for interdisciplinary teaching. “The idea that got us thinking about this together comes out of the famous essay by C.P. Snow about the two cultures. I’ve always felt

at the same sorts of questions? How do we bridge that gap? How do we look at theories of science and writings about science?”

“The other course that was my most interdisciplinary course is the technology and society requirement for the School of Engineering and has most

effect of technology. I find that either I, or most likely, people that I bring in, have to talk about various other disciplinary issues, because no single perspective will get you the right picture.”

“By bringing in a series of guest lecturers from those different departments, I can encourage people to take a multi-disciplinary view. The reason I think it’s important to do that is to break down hostility between different disciplines so that you don’t get that ‘lording over.’ It’s not the economists who are gods or the computer scientists who are gods, but we all need to bring our perspectives to the table.”

“I think we can do it in our own courses by bringing in different perspectives, and certainly by moving towards more team-taught courses where we take a broad overarching issue, such as the ones that the new initiatives are looking at, from a research perspective. Then take slices of it from different perspectives and synthesize those slices into a full spectrum of understanding of the problem.” ♦

“The split between the techies and fuzzies, between the two of them, a gulf of mutual incomprehension...and a lack of understanding. How do we bridge the gap?” Professor Eric Roberts

that it was perhaps better substantiated here at Stanford than at most places where he talks about the split between, if you will, techies and fuzzies. Literary intellectuals at one pole and at the other the scientists, most represented by the physical scientists, between the two of them, a gulf of mutual incomprehension, sometimes particularly among the young, hostility and dislike, but most of all, lack of understanding. So, what happens if we take a literary intellectual in Ramon and a scientific intellectual in me, and look

to do with computer science—computers, ethics, and social responsibility. I’ve taught it for about 12 years. Every student in the School of Engineering has to have some course in that area because people who are doing technology need to have some sense of what impact that technology has on the world. They don’t just need to know something about how that technology affects the rest of their world. They [also] have to know something about the interdisciplinary ways of thinking about how you might assess the

DVD copies of the complete panel presentation are available at the CTL library on online at http://ctl.stanford.edu/AWT/Celebration_06.html

The Center for Teaching and Learning
Fourth Floor, Sweet Hall
Stanford University
Stanford, CA 94305-3087
<http://ctl.stanford.edu>

