

SUMMARY OF THE REINVENTION CENTER WEST COAST
REGIONAL NETWORK MEETING
UCLA
April 16, 2004

I. Review of Reinvention Center Activities

- A. Interdisciplinarity: One of the strongest recommendations made at the Reinvention Center conference in November, 2002 was for the Center to work on ways to promote interdisciplinarity in undergraduate education. The Center has followed up in two ways:

Math/Bio Project: We applied successfully to the NSF for funds for a study to assess the extent to which and how quantitative approaches are being incorporated into the undergraduate biology curriculum at research universities and, conversely, to ascertain the ways in which undergraduate programs in mathematical and computer sciences are educating their undergraduates about applications of quantitative concepts and techniques in biological research. An overview of the findings is attached. A more detailed report will follow.

In addition, we are compiling an inventory of exemplary courses and programs at the bio/math intersection and posting descriptions in the Resources section of the Center's Web site (www.sunysb.edu/reinventioncenter). Although the inventory is still in a very early stage of development, we encourage you to check it out and to let appropriate colleagues know about it. We would like to include a wide range of examples and invite descriptions of courses at your university.

Spotlight Feature of the Center Web Site: Since the conference, the Center has twice made "interdisciplinarity" the focus of its Spotlight. The first Spotlight featured an essay by Greg Bothun, Professor of Physics at the University of Oregon on "Achieving Interdisciplinarity in General Education" and approaches adapted at UCLA, the University of Michigan, and the University of Texas. The current Spotlight, on "The Minor as a Vehicle for Interdisciplinary Education," offers an essay by Katherine Harrington, Associate Provost for Academic Programs at the University of Southern California and models that have been implemented at Binghamton University, Emory, the University of Massachusetts-Amherst, and the University of Oklahoma. Both Spotlights can be accessed through the Center's Web site (www.sunysb.edu/reinventioncenter).

- B. Assessment: Following up on the University of Delaware presentation on assessment at the conference, the Reinvention Center applied unsuccessfully to the NSF for a project involving the modification and implementation of the Delaware instruments on four campuses. The Delaware instruments, which had been developed by a panel of faculty and assessment specialists, were designed to assess the short- and long-term impact of participation in research on current undergraduates, alumni, and faculty. The proposal was rejected because the reviewers felt it relied too much on the Delaware instruments, which did not make "a systematic effort to capture or assess the learning advantages for students who participate in research." Since assessing the impact or "value added" of an undergraduate research experience remains a high priority among Reinvention Center constituents, after considerable discussion with officials at the NSF, the Center is proposing a new approach to the subject. Rather than continuing to focus on the

development of reliable tools, the idea is to shift the emphasis to the research experience itself –to determining goals and desired outcomes for undergraduate students, faculty, and graduate students, shaping the experience accordingly, and then developing tools to ascertain the extent to which the experience produced the desired goals and outcomes. Goals for undergraduate, for example, might be social as well as academic, and they may vary by undergraduate populations and by discipline. This approach is much more integrative than previous efforts and could potentially lead to more reliable instruments.

- C. The group endorsed this approach, but noted the enormous challenge of obtaining agreement on common goals and outcomes. Further, any assessment tools that result from this effort must be sufficiently flexible to accommodate local factors, such as limits on the number of credits undergraduates may take on an individual campus or the way the research experience fits into a students' program. There was a consensus that the best strategy would be to create an instrument with two components: a "universal" one that addresses common goals and expectations and can be implemented on any campus, and a "local" component that addresses specific campus-wide issues.

The Center will move forward with its plan to submit a proposal to the NSF for a series of meetings of a small group made up faculty and assessment specialists. The group will hammer out short- and long-term goals and desired outcomes of undergraduate participation in research and develop strategies for measuring the extent to which and how/why they are achieved. At the same time, Center staff will review instruments currently being used on research university campuses and by groups such as the HHMI teacher scholars to identify common themes and priority that might inform the group's discussions. Judi Smith (UCLA) and Lynda Goff (Santa Cruz) agreed to play a lead role. If you have colleagues on your campus who would be interested in being part of the group, please have them contact the Reinvention Center. Our goal is to form a 15-20 member group with individuals representing a range of institutions, regions, disciplines, and expertise.

- D. SLC Initiative: The Reinvention Center had submitted a proposal to the NSF for a Science of Learning Center (SLC) Catalyst Grant to study past and current NSF-funded Science and Technology, Engineering and Materials Science Research Centers to determine the extent to which and how they have incorporated research advances into their undergraduate education, and based on the findings, as well as on input from experts in the science of learning and various science disciplines, to identify effective models and practices and create an integrative prototype that campuses could use in developing their own SLCs. The proposal was rejected because the reviewers felt it did not fall within the SLC Catalyst program guidelines, which were designed to support local campus efforts to form consortia and lay the foundation for establishing an SLC. The NSF plans to establish a new category in its next solicitation that will accommodate proposals like ours. The Center will re-submit its proposal at that time.
- E. Center By-laws: Now that the Reinvention Center is almost four years old and appears firmly established, the Executive Board has determined to formalize its existence by creating By-Laws to guide its operation. The By-Laws strengthen the role of the regional networks by calling for the creation of Advisory Boards for each network. One member of each regional Advisory Board will also serve on the Executive Board. The Executive Board also determined to initiate a Center institutional membership fee of \$1,500 to be used for operating expenses and special initiatives. Those present appeared to recognize the need for the membership fee. Following the recommendations of the Northeastern

and Southeastern networks, in recognition of the severe budgetary problems many universities are experiencing, the Center will not implement the membership fee until January, 2005.

II. North Carolina State Survey

At the request of George Barthalmus at North Carolina State, Wendy Katkin distributed a survey that seeks information on financial support for undergraduate research at research universities was. The survey is attached here as well. If you haven't already done so, please fill it out and return it to George Barthalmus (address on survey) or The Reinvention Center (fax: 801-720-7529). North Carolina State will share the findings with the Reinvention Center and we will post them on the Center Web site.

III. A Review of the Program for the Reinvention Center's Next Conference

There appeared to be general satisfaction with the conference program and most of the sessions. At the group's recommendation, the session on graduate student education, which initially had a very broad thrust, has been modified and will now focus on graduate students' role as teachers and supervisors of undergraduate research. In addition, following up on Lynda Goff's suggestion about inviting a senior administrator in a science or high tech field to talk about the skills potential employers are looking for in graduates, we contacted Bruce Chizen, CEO at Adobe. He is unable to do it. **If you know of any individuals from the private sector who could speak to this issue or a related issue, please let Wendy Katkin know asap.** It was noted that several topics, specifically research ethics and responsible research conduct, research methodology, and teaching communication skills, are not addressed in the conference program. The group agreed that these topics could be woven into the existing sessions. Similarly, there are no sessions focusing exclusively on assessment. This decision was based on the recognition that assessment of any initiative must relate directly to the goals and desired outcomes of the initiative. Breakout session leaders will be asked to frame the discussions where appropriate to include such questions as what are the learning outcomes you seek for your students and how can you measure your effectiveness in achieving them.

The most recent version of the conference program is attached. You will note that we still need leaders for a few breakout sessions (though in some cases invitations have been extended). Again, please send Wendy Katkin asap the names and contact information of possible candidates.

IV. Development of a Prototype of a "Research" Learning Communities

Capitalizing on the current interest on university campuses in creating small learning communities, the Reinvention Center is exploring the development of a prototype of a learning community organized around research. Such a community would target 1st and 2nd year students and consist of curricular and co-curricular activities designed to prepare them for meaningful participation in research. A distinguishing element would be the community's strong grounding in the liberal arts and the linkage between students' science education and their study of literature, writing, and ethics for example. The goal will be to develop a model that engages students in inquiry-based learning early and helps them from the outset to develop the broad competencies and specific disciplinary skills they will need for a productive research experience. This discussion on what this prototype might look like was led by Lynda Goff, Associate Provost and Dean of Undergraduate Education at UC-Santa Cruz. Goff began by providing a brief overview of the Santa Cruz college system. The colleges are all organized as learning communities. Students enter a college in the first year, remain associated with it for all four

years, and graduate from it. Over the four years, members develop a strong sense of community. While there is great variety among the colleges, all offer curricular and co-curricular academic experiences, ranging possibly from freshman seminars to research experiences, and they provide support services such as advising and degree auditing. In addition, they all have venues that enable students to have frequent interactions with faculty.

The colleges face two major challenges. One relates to turf and the interface of lower and upper division courses and the interactions between departments and the colleges. The second challenge derives from the high cost of undergraduate education within the college and the ongoing need, especially in the current fiscal climate, for a vigorous development campaign to support many of its activities. Porter College, for example, has a \$5 million endowment, which is used to support co-curricular learning experiences, including research. Similarly, Crown College provides similar experiences with funds given by the Crown Kellerbach Corporation.

The Santa Cruz college system has been in place since the university was founded and is central to the university's identity and administrative structure. Most efforts at creating learning communities are much more recent, and they often build on existing courses or programs. Greg Bothun described the "Pathways" model at the University of Oregon which is designed to provide 1st and 2nd-year students both with essential foundations and with skills in integrating knowledge across disciplines and to prepare them to make the transition from "classroom" learning to "research" learning. Each pathway involves a cohort of approximately 25 students who together take two foundation courses on thematically-related academic subjects, plus a "Connections" seminar. The courses help fulfill their general education requirements. The students benefit from the small size of their learning community, from the coherence the seminar brings to the courses and the interdisciplinary knowledge they gain, from their close and frequent interaction with faculty and with advanced undergraduate who participate in the Connections course, and from the academic advising that is part of the pathway approach.

Bothun, who is a Professor of Physics, co-teaches (with a Professor of History) a capstone course on "Science and Culture" that focuses on the historical development of science and the cultural conditions that must exist before scientific theory is accepted. The course has three main goals: 1) To get students to understand that science is a process deeply embedded in culture and languages; 2) To get students to realize that "scientific knowledge" is largely acquired via a combination of accidental discovery and an open mind, and 3) To get students to work together collaboratively to form and present hypotheses based on thinking critically about some set of observations or experiments. Students work together in teams to do various observations or experiments and to present their observations to their peers. The team work, written reports and public presentations are all key to its achieving its goals.

Dan Bivona, Associate Dean for Academic Programs, described Arizona State's living and learning communities which are located within individual colleges and directed at first-year students who share academic interests. The communities enable the students to live in a common residence; together explore critical issues facing society through special interdisciplinary class clusters that focus on a broad theme such as "Multicultural America," "Human Diseases," and "War, Culture and Memory." The "Human Diseases" cluster for example brings together Biology, English and the Classics (the writings of Boethius). The cluster on "Multicultural America" involves students and faculty in Women Studies, Anthropology, and English. The academic course work is supplemented by co-curricular activities that enhance the students' intellectual development. An added benefit of the living and learning communities is that opportunity it affords students to develop a supportive network of peers on campus. Arizona

State is strongly committed to the learning community concept and plans to expand the communities to serve 600 first-year students per year.

Bivona noted several challenges that ASU faces in achieving this goal. Most of these challenges exist at other universities as well:

- . Faculty development. The clusters require a new mode of teaching. Many faculty have difficulty making the transition from a traditional disciplinary model to one based on interdisciplinarity and collaboration.
- . Student recruitment. The first cluster ASU initiated—on human disease—attracted many pre-med students, but attracting students to clusters that are more broadly focused and have no apparent direct relevance is proving more difficult. Students are deterred by the complexity of thematically organized courses (though the clusters do appeal to parents).
- . Problems of quality control. Faculty often lose sight of the goals of courses taught as part of a cluster, which differ from those of traditional courses. Another issue is how to maintain the cluster perspective without cramping the instructor's individual style.

Steve Simcik., Coordinator of Graduate Programs, OPSA, reported on the Life Sciences Learning Community (LSLC) at Texas A&M University. This one-year program began as a departmental initiative in 2001 with 20 first-year students, all prospective biochemistry or genetic majors identified through conferences Texas A&M has for incoming students. It seeks to improve the retention of students in the Life Sciences through informal seminars and discussion groups led by faculty and upper level students, group research projects, and enrichment activities. The seminars are given by leading researchers, including a Nobel Peace Prize recipient, and focus on broad themes such as the role of science in the contemporary world or scientific process, as described by James Watson, for example, in *The Double Helix*. Advanced undergraduates may give presentations on their own research or on research opportunities. The LSLC has a one-semester research requirement. The enrichment activities include field trips and cultural events designed to increase students' international and cultural awareness. In recent years, students have visited the Bullock Museum of Texas History and the Museum of Fine Arts in Houston and they have attended performances of the Opera and Performing Arts Society.

V. Humanities Initiative

Humanities faculty attending the Reinvention Center conference in 2002 urged the Center to sponsor forums that focus exclusively on undergraduate education within the Humanities. The Center followed up with a proposal to the NEH, to establish a network made of faculty whose research and/or teaching was in literature; the idea was for the network to provide a structure through which these faculty collectively could address disciplinary and institutional challenges that are fundamental to undergraduate teaching and study of literature. The proposal was rejected. The Center is therefore moving forward another way. First, it has set aside time at all four network meetings in the spring 2004 for discussions of what faculty would like to see happen at the forums and to consider also such questions as what undergraduate scholarship means in the humanities and how scholarship should be conceptualized in relation to the discipline and in relation to interdisciplinary interests. Following this round of meetings, the Center will convene a small group of faculty across all humanities disciplines to sift through and give shape to the recommendations and develop an agenda for the Center. Colleagues from the Carnegie Corp., National Humanities Center, ACLS and possibly organizations like the Consortium of

Humanities Institutes and Centers, (made up of directors of Humanities Centers) will be invited to participate.

Reed Wilson of UCLA led the discussion on the Humanities discussion, noting that "We need to demystify the notion that humanities does not lead to anything. We need to articulate that students are getting something."

Nichole Fazio, Office of Undergraduate Research, and Jill McKinstry, University Libraries, presented the several approaches adopted at the University of Washington for "Creating an Intensive Introduction to Scholarly Work for Students of the Humanities." The goals were to:

- Increase the number of undergraduates doing research in the humanities
- Provide intensive research opportunity for humanity students
- Engage humanities faculty in research with undergraduates
- Create research training tools for faculty to use with individuals and groups of students
- Establish a community of scholars
- Create a forum for humanities undergraduates to present their scholarly work.

UW has established a Summer Institute in the Arts and Humanities which enables 20 students -- mostly sophomores and juniors-- chosen through a competitive application process, to develop and work full time on a research project related to an interdisciplinary theme. In addition, the students participate in small discussion groups with faculty and peers and attend weekly teas and lectures. They are required to write a major paper (20-30 pages), for inclusion in a magazine/multimedia collection, and to give a presentation at a final symposium. Students, earn credit for their summer work. The Institute is led by four paid faculty leaders. Funding is provided by the Offices of Research, Summer Quarter, Simpson Center for the Humanities, Office of Undergraduate Education, Mary Gates Endowment for Students, and the University Library. Now in its third year, the Summer Institute has been both challenging and rewarding—and more work for all than anticipated. Students and faculty alike value its interdisciplinarity and its collegiality, and most of the faculty have continued to work with undergraduates. One student noted two aspects of the Institute that were “especially stunning:” the self-confidence she gained from the discovery that she could write something “this long and remain coherent,” and the “opportunity to work closely with so many talented professors, those who are shaping their fields,” which was “inspiring.” Most students used their Institute experience to leverage other opportunities. The challenge is how to scale up. This will require departmental participation and stable funding.

A second UW approach is the N.A.K.E.D. Lunch Series, a weekly, informal presentation series created for undergraduates at which faculty, students, visiting scholars, community members and artists introduce the students to their current research and creative work. The success of the N.A.K.E.D lunch series has led to the creation of “Research Exposed,” a one- credit course in which students learn about current research in a wide variety of disciplines, and learn also about the process of discovery: how faculty come up with an idea for research, how inquiry is structured in the different disciplines, and how students can become involved in the knowledge-making process.

The University Libraries in cooperation with the Undergraduate Research Program sponsors the “Library Research Award for Undergraduates” Competition that recognizes UW students who produce significant inquiry that requires use of the library, its recourses, and collections.

Humanities faculty are urged to read Reed Wilson's article, "Researching 'Undergraduate Research' in the Humanities," to be published in the *Modern Language Quarterly*.

Wilson posed two questions: "What do we mean by humanities?" and "Why is it so hard to engage students in research?" There is great diversity within the humanities. Bill Ladusaw, Professor of Linguistics at UCSC, suggested that for humanists there are two challenges. The first is the "invisibility of the long distance humanities researcher and the loneliness of the scholar." Visitors to any science department see posters on the walls and know what students are doing. This is not the case in the humanities, where the model is the researcher alone in the library. The second challenge relates to the emphases on replication and accumulation of knowledge in the sciences. In contrast, in the humanities, it is considered bad form to replicate. McKinstry commented on the merits of adopting an interdisciplinary team approach in humanities research. It creates new opportunities and venues, makes it possible for more students to participate and it fosters the kind of collegiality that makes the Summer Institute so successful. She noted for example that at UW, the Digital Animation team needs the artists for the graphics, the English majors for the writing, the biologists for the science, and computer science for the animation.

The group came up with several strategies for involving undergraduates in research.

- Look at programs like the McNair Scholars Program and create Scholars in Humanities and Social Science
- Expand the poster model in the humanities.
- Encourage humanities departments to use more collaborative, interdisciplinary approaches. Humanists need to get over resistance to working in teams. They need to be actively involved themselves and share their research with others. It is ironic that humanities faculty seem to favor "papers" over "talks" and are more demanding in the "output," i.e., individual term paper. They favor "product" over "process."
- Begin earlier. We need to focus on the transition from 100- to 200 courses (from sophomore to junior), try to catch the students early and then track them into upper division courses that will stimulate further interest.

Lowell Gallagher, Associate Professor of English and former head of the departmental Honors Program; Caroline Streeter, Assistant Professor of English and African Studies, and Martha Webber, an undergraduate student who worked with Carolyn, gave a presentation on the UCLA English Department's Honors Program. There are several key elements that make it work well.

- 1) Students take a seminar in the winter or spring quarter, which is designed to socialize them into literary scholarship. They begin by bringing papers they find in journals to class, reading them closely and analyzing them. One goal is for them to learn both the technical vocabulary and "tricks of the trade:" How to read within and around a piece of scholarly writing, how to evaluate the content, how to understand the investment in the issue. A second goal is to help them begin the process of gradually defining and selecting a topic. They write one sentence in week one, one paragraph in week two, two paragraphs in week three and bring a scholarly article to class to read.
- 2) Working with an individual librarian was identified as perhaps the most important element in their research project. The students believe that the librarians are there to work with them and are given a boost when the librarian becomes familiar with their research. They help them not to become overwhelmed. UCLA keeps all theses.
- 3) It is helpful for students to think of their thesis as a constellation of separate parts so that if they are having difficulties in one section, they can jump to another.
- 4) Mentoring by instructors, faculty, TAs, lecturers, and librarians is critical. The issue of work load needs to be addressed since mentoring requires a significant commitment of

time, something most people lack. Wilson suggested that students who are unable to find a mentor be educated to adjust their expectations.

The group suggested several topics for further discussion.

- How do humanists “get a foot in the door?” When we talk about humanities research, we need to make it an important component of our teaching so that students understand what we do.
- How do we address differences between the sciences and the humanities? The University of Delaware uses a model that is based on the scientific model in that undergraduates pursue a research topic that relates to the faculty member’s work. The benefits to this approach are that it fosters a sense of genuine collaboration between student and faculty supervisor, requires a little less time than if the student works in an area in which the faculty member is less familiar, and it can benefit the faculty member. However, the expectations of faculty in the humanities and sciences often are different. There was a consensus that humanists can borrow models from other fields of inquiry, but within limits.
- How can we get collaborative models to work?
- How can we get faculty on board? Possible incentives include giving teaching credit for supervising students and providing funding, perhaps through salary supplements or special grants or awards. Streeter observed that she feels that it is part of her job as a tenure track professor to supervise undergraduates.
- How can we involve graduate students? No one had a good answer. Graduate students in the humanities are wary about supervising students because of the numerous responsibilities they already have. One suggestion was the creation of “super” graduate student fellowships, to be awarded on the condition that recipients bring undergraduates into their work.
- How can we disseminate student work? There was a consensus that we need to move beyond the standard talk and create a range of models. One idea was to disseminate work through posters. This would work especially well for presenting work in progress.

VI. Undergraduate Research Journals

There was a brief discussion on the merits and efficacy of undergraduate research journals (online and in printed format). Martha Webber, the UCLA student, spoke positively about her experiences working as part of a team to edit the *Westwind: UCLA Journal of the Arts*, <http://www.studentgroups.ucla.edu/westwind/>. Participating in the review process with her peers has been helpful in developing critical thinking skills. The important part of the peer review is the debate; the product is the excuse for the debate. She emphasized that the journal is not just a showcase, but a demonstration of collaborative learning. This experience is contrasted to writing a paper by yourself and to be read by only the faculty. The fellowship is an important element of the collaborative learning.