Center for Workforce Development Research Projects

The Executive Director of the Center for Workforce Development serves as a Principal Investigator or co-Principal Investigator on a number of research projects. CWD has also contracted with University of Washington faculty members to manage select elements of National Science Foundation funded projects. A brief abstract of each of the major research projects is available below.

Center for Institutional Change, National Science Foundation ADVANCE Institutional Transformation Award

With a National Science Foundation ADVANCE Institutional Transformation Award, the University of Washington created the Center for Institutional Change (CIC) to help transform the culture at the UW. The UW ADVANCE project was designed to build upon existing strengths at the university while serving as the catalyst for institutional transformation. The CIC focuses on the implementation of programs designed to eliminate existing barriers and to precipitate cultural change at both the departmental and the institutional level. The UW ADVANCE Center for Institutional Change has six major components:

- Leadership development for science, engineering, and mathematics (SEM) chairs and deans
- Department cultural change
- Examination of UW policies for equity and policy transformation
- Mentoring women in SEM for leadership;
- Visiting scholars who can contribute to the goals of the project
- Transitional support for female faculty members in SEM departments

The Center for Workforce Development serves as the internal evaluator for the ADVANCE grant and manages a faculty and graduate student mentoring program for the CIC. CWD also coordinates the external evaluation process led by the American Association for the Advancement of Science (AAAS).

IGERT/Nanotechnology Mentoring Program & Student Tracking Project, National Science Foundation

The Center for Nanotechnology (CfN) at the University of Washington received a five-year Integrative Graduate Education and Research Traineeship (NSF-IGERT) award, from National Science Foundation in 2000 to introduce an Optional Ph. D. Program in "Nanotechnology". As part of its outreach component CfN partnered with the Center for Workforce Development (CWD) to create a Nanotechnology Graduate Student Mentoring Program and track student progression through the new interdisciplinary program. The partnership between the two centers has proven to be an effective means for providing students with support, monitoring their experiences in an interdisciplinary program, and documenting the impact of the program on career outcomes.

The student tracking system created by the Center for Workforce Development includes three questionnaires:
1) Nanotechnology Initial Interview Form (NIIF), which is administered to students upon entry to the program;
2) Nanotechnology Continuing Interview Form (NCIF), which is administered to students at the end of each year in the program; and
3) Nanotechnology Exit Interview Form (NEIF), which is administered to students shortly after graduation from the program.

The mentoring program began its pilot year during autumn quarter 2001. Graduate students affiliated with the Center for Nanotechnology are paired with either an industry or faculty mentor. As part of the mentoring program the mentee/mentor pairs are encouraged to attend the seminars, workshops and luncheons put on by the mentorship program to facilitate networking and supplementary educational material. To date some of the seminars developed for the program include topics such as: Entrepreneurial Development of the Nanotechnology Company, Negotiating Academic Appointment Contracts, Grant Writing, and CV/Resume Development for Nanotechnology Students. The program is evaluated annually to monitor the satisfaction of participants.

National Nanotechnology Infrastructure Network, National Science Foundation
The National Nanotechnology Infrastructure Network (NNIN) was established with funding from the National Science Foundation in 2004. The project is led by Cornell and Stanford, and the Center of Nanotechnology (CNT) at the University of Washington is part of the collaboration with Georgia Institute of Technology, Harvard University, Howard University, North Carolina State University, Pennsylvania State University, UC Santa Barbara, University of Michigan, University of Minnesota, University of New Mexico, and University of Texas at Austin. The primary objective and role for the UW within this network is to build the interface between nanotechnology and the biomedical community.

The Center for Workforce Development has been contracted to manage three elements of the outreach component of the NNIN grant:

1. Document and observe the processes, progress, and changes that occur in this multidisciplinary, multi-site and multi-PIs collaboration. A conceptual framework will be designed for observing and documenting the history of the growth and changes in the workforce and careers in Nanotechnology, maturity of the interdisciplinary, multi-site collaboration, the nature of the advances resulting from the research, and the impact on student career outcomes. The conceptual framework will include but is not limited to the following: collaboration and participatory decision-making; advances in technology, research, and human capacity building; new breakthroughs in research – unanticipated and anticipated, issues that result from different institutional cultures, budgets, start-up; conditions and variables that facilitate or constrain the quality of the collaboration; teaching and learning experiences of faculty and students, including changes in curriculum; faculty development; student perceptions of their satisfaction with their learning environment and prospects for career opportunities; diversity of research teams, of leaders, of graduate students, other personnel; patents and publications; and policies
and policy changes at the collaborating institutions. Following the development of the conceptual framework, baseline data will be collected on the factors and variables that will be documented throughout the 10-year grant. Data gathering methods will include both quantitative and qualitative measures, including observations, questionnaires, interviews, and focus groups.

2. Conduct a qualitative study to assess the patterns of communication in the management team, the strategies for multi-disciplinary, cross-site collaboration and work. Communication between and among the Co-PIs and other senior personnel will be examined with a specific interest in frequency, type of communication (phone, email, etc.), follow-through, and perceived satisfaction of the participants. In addition, other areas of examination will include: conflict resolution, leadership styles and roles, changing roles as different tasks are pursued, change in relationships, and frequency of contact and interactions over time. Data gathering methods will include primarily qualitative measures, including observations, questionnaires, interviews, and focus groups.

3. Build on the success of an award-winning mentoring program for graduate students and faculty, CWD will work with the PIs at each institution to establish and evaluate a faculty and graduate student-mentoring program. A “train the trainer” approach will be utilized. The training will include the award-winning curriculum for training faculty and graduate students in the benefits of mentoring, b) implementation of a tracking system tool that will be standardized across all institutions, and c) evaluation tools already prepared to assess their programs. Each institution will conduct its own mentoring program and training and track their students in the program over the duration of the project. The purpose is to assess the mentoring program and its impact on retention and advancement of all student participants and to assess the students’ and faculty perceptions of their satisfaction with their technical work. Special attention is diversity and broadening the impact of the field with groups not traditionally represented in science & engineering careers will be given with respect to gender and ethnicity. Project tasks include: track student (academic progress, perceived satisfaction, mentoring experience); include students in an existing climate survey; implement a mentoring program at each of the collaborating institutions; train the trainers at each institution to implement the mentoring program; and, provide a standardized tool to each institution for tracking students progress and train the appropriate people in each institution how to use and maintain the tool.

Translation Technology for Language Modeling, National Science Foundation

Dr. Mari Ostendorf, a Professor of Electrical Engineering at the University of Washington, is the Principal Investigator on this NSF funded project. The goal of the Translation Technology for Language Modeling (TTLM) project is to integrate machine translation and speech recognition language modeling techniques to develop a new source of data for learning structure in language. The model will be investigated for potential use in bilingual K-12 education. The University of Washington and the Information Sciences Institute at the University of Southern California are collaborators on the project.
The Center for Workforce Development has been contracted to manage three elements of the outreach component for the grant:

1. Student Training and Mentoring: CWD’s award-winning mentoring program will be used at both institutions to develop mentoring programs for graduate students affiliated with the TTLM research project. CWD will track the students in the program over the duration of the project, to assess the mentoring program and its impact on retention and advancement of all student participants and to assess the students’ perception of their satisfaction with their technical work on the grant. Special attention to diversity will be given with respect to gender and ethnicity.

2. Pilot project evaluation: CWD will conduct a formative assessment of the pilot project investigating language technology for bilingual education. This will include a formative evaluation of the pilot project with elementary schools focusing on bilingual education. It will include an assessment of student and teacher experiences testing the new language tool. The first two years would involve assessing communication between elementary school teachers and researchers, and the second two years will involve assessing classroom activities.

3. Collaboration with NSF ADVANCE: Dr. Suzanne G. Brainard, CWD’s Executive Director and a co-PI on the NSF ADVANCE grant to the UW, will assure that the PIs on this grant take advantage of the mentoring and leadership programs in the Center for Institutional Change (CIC), where the grant leadership is housed. The ADVANCE grant goal is to increase the retention and advancement of female faculty in science, technology, engineering and mathematics fields. The TTLM grant leadership will be invited to participate in numerous leadership and mentoring workshops, with the goal being improvement and enhancement of the management of the TTLM project.

Student Support Services & Impact on STEM Career Outcomes, National Science Foundation
This project builds upon on a ten-year longitudinal study of female undergraduate science and engineering students at the University of Washington. The goal of the study is to identify outcomes of undergraduate education in the science, technology, engineering, and mathematics (STEM) fields by collecting qualitative and quantitative data longitudinally of students’ experiences beyond the bachelor’s degree. Thus, the purpose of this research study is fourfold: 1) to assess the summative impact of student support programs and other programs on student career outcomes; 2) to develop a standardized methodology for evaluating student career outcomes and the relationship to participation in student support programs and related support programs; 3) to pilot-test and evaluate the methodology nationally at selected institutions, to ensure generalizability across institutions, and 4) to disseminate the model methodology nationally. This unique approach will include a web-based format that can be used nationally by institutions, with a back-end database and analysis capability.
In addition to UW, three higher education institutions participate as pilot sites. These institutions include: University of Michigan, Ann Arbor, MI; University of Puerto Rico, Mayaguez, PR; and the Florida International University, Miami, FL. These four institutions are representative of institutions nationwide, broadly reflect the Carnegie classification of institutions, and provide significant numbers of Hispanic and African-American students. Two of the pilot sites have well-developed WISE programs with a broad range of services; two institutions do not have WISE programs, but have related support services. Florida International is a large producer of Hispanic engineers. These institutions have been selected to assure women of color are represented in the analyses. Another institution will be added in 2004 to ensure adequate representation of African American women.

The products that will result from this study will include: 1) a template for a user-friendly data collection method for tracking student support program participation and career outcomes, 2) a web-mediated survey instrument and data collection method that institutions nationwide can use and which will be analyzed by CWD and disseminated to participating institutions, 3) an Exit Survey and a Professional Survey to gather career outcomes information, and 4) the results of a pilot-test at six institutions.

**Study on the Implementation of Part-Time Tenure Track Faculty, The Sloan Foundation**

As part of its research thrust, the Center for Institutional Change/UW ADVANCE applied for and received a Sloan Foundation grant to conduct an exploratory study on the implementation of part-time tenure-track faculty careers at the University of Washington. The research project is managed by the Center for Workforce Development and includes:

- A comprehensive review of part-time practices at U.S. colleges and universities to identify models.

- Examination of University of Washington policies related to part-time faculty employment including compensation scales, departmental procedures for replacements, and evaluation standards for promotion and tenure.

- Interviews with UW faculty who have utilized existing part-time and tenure clock extension policies regarding their experiences. Through these interviews, evidence can be obtained regarding the successes and failures of these policies. This information will then be analyzed to determine if policy changes are needed to facilitate implementation of part-time tenure track faculty careers at the University of Washington.

Results will be disseminated to other ADVANCE institutions and other colleges and universities interested in implementing part-time tenure track faculty careers.