

A CURRICULUM FOR TRAINING MENTORS AND MENTEES

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Abstract

The purpose of this article is describe the background and process that led to the design, development, pilot-testing, evaluation and dissemination of *A Curriculum for Training Mentors and Mentees in Science and Engineering*. Created to improve the current practices of mentoring in science and engineering, this curriculum is transferable to other disciplinary fields.

Background: The Women in Engineering (WIE) Initiative

The Women in Engineering (WIE) Initiative is a university-level organization designed to increase the recruitment and retention of women of all ethnic backgrounds in science and engineering (S&E) and to create an academic and social climate at the UW which is conducive to both men and women in S&E at the undergraduate and graduate levels. To attain these goals, the specific objectives of WIE are: to build a collaborative and learner-centered environment for women in S&E; deliver recruitment, retention, and workforce preparation programs; and conduct research studies related to women in S&E. WIE provides both academic and support programs, including: Tutoring, Professional Mentoring¹, Peer Mentoring Advising, Undergraduate Retention Interventions, and a Graduate Program² for the recruitment and retention of graduate students. All programs are evaluated annually; documentation on each program is maintained; and a longitudinal data base tracks undergraduate students from their entry through graduation. Several research studies have been published on the evaluation of each of the intervention programs³.

At the outset in 1989, WIE served 50 women; today it serves over 1,300 a year on the UW campus and about 3,000 students off campus. The organization has grown from a program concept to one of the most respected women in engineering programs in the country. It now serves a culturally diverse group of undergraduate and graduate students who are interested in engineering and the related sciences. Since the late 1980's, the UW

has seen increased percentages of degrees granted to women at both the undergraduate (from 15% to 23%) and graduate levels (from 6% to 22%), both well above national norms. In addition, the number of female faculty in engineering has increased from 6 in 1988 to 26 in 1996, where they are now 11% of the faculty (as compared to 3.7% nationally). Faculty have played a key role by contributing their time and expertise in working with students. Corporate mentors and other professionals have invested time and money to keep students and faculty abreast of the current needs and trends of industry in a global economy.

Coupled with increased enrollments and degrees granted to women in engineering at the undergraduate and graduate levels, WIE has also seen an increase in retention at the undergraduate level from 50% in 1990 to 74% in 1997⁴. In addition, the evaluation studies examining the impact of mentoring on female students' retention have revealed some exciting results. Retention rates of students participating in the professional mentoring program is 97%, in contrast to the average national retention rate of 55%⁵. The research in this area led to the development, pilot-testing and evaluation of a curriculum for training mentors and mentees, which was published and disseminated August 1998.

WIE is also the site of the WEPAN (Women in Engineering Programs & Advocates Network) Western Regional Center. As the WEPAN Western Regional Center, WIE conducts national research studies on women in engineering and the related sciences, develops training materials and curriculum, and provides technical assistance and training to colleges and universities to initiate or expand gender-related interventions at the pre-college, undergraduate, graduate, and faculty levels.

The Curriculum for Training Mentors and Mentees in Science & Engineering

Building on the success of the WIE Mentoring Program and the preliminary training materials that had been developed, WIE received funding from the National Science Foundation and the Department of Education (FIPSE) for the development, pilot-testing and evaluation of a curriculum for training mentors and mentees. The Dow Chemical Company and WEPAN were instrumental in funding the creation and development of the video and video guide. Entitled *A Curriculum for Training Mentors & Mentees in Science and Engineering*, the primary goal was to improve the current practices of mentoring and to disseminate the Curriculum nationally. The Curriculum was pilot tested at the University of Washington, University of Michigan, Carnegie Mellon University, Seattle University, and Pacific Lutheran University. An external evaluator, Dr. Patricia Campbell of Campbell-Kibler Associates, played a significant role in shaping the design of the Curriculum as well as the evaluation. In addition, an Advisory Board of WEPAN members also reviewed the Curriculum several times before final publication. The Curriculum has been copyrighted by Suzanne Brainard at the University of Washington.

The *Curriculum for Training Mentors and Mentees in Science and Engineering* includes:

- an administrator's guide with a comprehensive curriculum
- individual handbooks for students, faculty, professional scientists and engineers
- a stand-alone bibliography of resources
- a stand-alone evaluation module
- a video of scenarios depicting mentoring relationships
- a facilitated guide for group discussion.

The content is comprehensive and covers a multitude of topics including:

Overview

Purpose

Need for Training Mentors and Mentees

A Working Definition of Mentoring

Content of *A Curriculum for Training Mentors and Mentees*

Strategies for Delivering Training

Determining Your Needs for Training

Summary

References

Forms

Conducting Training Sessions

Introduction

Resources: Physical and Human

Delivering Training

Summary

References

Forms

Core

Introduction

The Mentor and Mentee Handbooks

The Goals of Mentoring and Training Mentors and Mentees

Benefits to the Mentors and Mentees

Responsibilities of Mentors and Mentees

Expectations

Guidelines for Mentoring

Types of Mentoring Relationships

Mentoring Challenges: Stereotypes, Biases, and Discrimination

Navigating a Cross-Gender Mentoring Relationship

Navigating a Cross-Racial Mentoring Relationship

Potential Pitfalls and Helpful Hints

Resources: Where and When to Go for Help

Periodic Assessment by Mentors and Mentees

Core (continued)

- Summary
- References
- Forms

Complementary Curriculum:

Faculty Mentoring Graduate Students

- Introduction
- The Role of the Advisor in a Graduate Student's Life
- Advising Versus Mentoring
- Special Issues During Stages of Graduate School
- What Graduate Students Can Do
- What Faculty Mentors Can Do
- Discussion Topics
- Summary
- References

Complimentary Curriculum:

Interpersonal Communication

- Introduction
- Defining Interpersonal
- Perceptions
- Negotiating Who We Are
- Language
- Nonverbal Communication
- Listening
- Content of Conversations
- Managing Conflict
- Special Communication Formats
- Summary
- References

Complimentary Curriculum:

How to Set-Up a Mentoring Program

- Introduction
- Goals and Objectives
- Organizational Structure of a Mentoring Program
- Implementation Strategy
- Summary

Evaluation

- Introduction
- Reasons for Evaluating
- Benefits of Evaluation
- Types of Evaluation
- Selecting an External Evaluator

Evaluation (continued)

Administering the Pre-Designed Evaluation Questionnaires

Summary

References

Forms

Bibliography

Appendices

Appendix A: Student Mentee Handbook

Appendix B: Professional Mentor Handbook

Appendix C: Faculty Mentor Handbook

Appendix D: Video Guide

Appendix E: Overheads

The *Curriculum for Training Mentors and Mentees in Science and Engineering* is now being used regularly in several engineering departments at the University of Washington, continues to be implemented by the WIE Mentoring Program each year, and is also going to be implemented in Denmark to train industry mentors and university students. Several corporations have indicated an interest in having the Curriculum customized for their companies. The Dow Chemical Company, WEPAN, NSF and FIPSE have made it possible for all WEPAN member institutions to have an opportunity to receive one copy of the Curriculum this summer. Finally, more than 200 requests for copies from community colleges, high schools, corporations, non-profit organizations and state public agencies have been received.

References

¹ Brainard, S.G. and Ailes-Sengers, L.A. (1994). Mentoring Female Engineering Students: A Model Program at the University of Washington. *Journal of Women and Minorities in Science and Engineering*, 1 (2), 123-135.

² Saghafi-Adib, P. and Brainard, S.G. (1995). Design and Evaluation of a Graduate Program for Women in Engineering. *Proceedings of the Sixth Annual WEPAN Conference*. Washington, DC, 133-138.

³ Brainard, S.G. and Carlin, L. (1998, manuscript in press). A Longitudinal Study of Women in Science and Engineering. *Journal of Engineering Education*.

⁴ Brainard, S.G., Laurich-McIntyre, S., and Carlin, L. (1995). Retaining Women in Science and Engineering. *Journal for Women and Minorities in Science and Engineering*, 2, (4), 255-267.

⁵ *Ibid.*, Brainard, S.G. (1994).

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