

CAREERS IN SCIENCE AND ENGINEERING: A SPEAKER'S SERIES IN
COLLABORATION WITH AN NSF VISITING PROFESSOR

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Research shows that vicarious learning is an important source of information¹. In other words, one need not experience something personally in order to learn. For example, simply seeing someone walking in front of you trip over an obstacle on a path is sufficient for you to avoid that obstacle yourself. You don't have to trip over that same obstacle to learn that it can impede your progress. By the same token, if you see that same person enjoying their journey on the path despite the occasional trip-up, you are more likely to venture down the path yourself. You would have learned, vicariously, that the journey is worthwhile. It is this principle of vicarious learning that underlies why role models can be important sources of information for young women entering engineering: Role models can point out the pitfalls while demonstrating how rewarding a career in engineering can be.

In collaboration with Dr. Renee Diehl, a National Science Foundation (NSF) Visiting Professor in ASU's Physics Department from Pennsylvania State, the Arizona State University's (ASU) Women in Applied Science and Engineering (WISE) Program hosted a Careers in Science and Engineering speaker's series during the Spring semester, 1995. With funds provided by the NSF grant, six renowned women scientists and engineers were brought to campus to speak with students. The speakers came from a variety of working environments and backgrounds, but shared two common elements: 1) They are women in non-traditional fields and are able to point out the obstacles they have encountered; and 2) They are testaments to how rewarding a career in science or engineering can be.

A list of potential speaker's names was generated by Renee Diehl and the WISE Program. The first speakers contacted were encouraged to recommend other speakers. The speakers were chosen based on their experiences, accomplishments and current position. The speakers were: Christine Platt, Ph.D., Assistant Director for Corporate and Federal Programs, Science and Technology Center for Superconductivity; Donna Chapple, Director of Information Technology, Ameritech; Carol Kemelgor, MSW, ACSW, co-author of "The Paradox of Critical Mass for Women In Science"; Elcira Villarreal, Ph.D., Senior Virologist, Lilly Research Laboratories; and Joan Gosink, Ph.D., Director, Division of Engineering, Colorado School of Mines.

Approximately every three weeks a speaker visited campus. Each speaker's travel arrangements were made through the WISE Program and speakers received a \$500 honorarium. In general, the speakers participated in activities on campus for one to two days. They first attended a breakfast with the Deans of the College of Engineering and Applied Science and College of Liberal Arts and Sciences (CLAS), as well as the Vice President of Research, and other high-visibility administrators. Each speaker received the vita of the breakfast participants, and participants received copies of each speaker's vita before the breakfast.



The breakfast meeting was a unique way to educate administrators about the issues that face women in science and engineering through highly credible individuals with first-hand experience. Also, the Careers in Science and Engineering series was the WISE Program's first collaboration with the College of Liberal Arts and Sciences. The speakers' breakfast allowed the participants to

explore the possibility of expanding or creating programs, while building the WISE Program's credibility university-wide. As a result of these meetings, the Dean of the CLAS is planning to develop a program similar to WISE.

During the morning, speakers met with WISE staff and were given tours of campus or specific labs of interest. Over lunch, the speakers met with graduate women and faculty in small group settings to discuss personal trials and achievements. Faculty and graduate students who were in closely related fields to each speaker were contacted by phone and invited to the luncheon. Through this forum, graduate students and faculty were able to communicate with one another across Colleges, and in unprecedented ways. In particular, junior and senior female faculty began to network with each other to share tips on getting tenure, how to win the respect of students, and other professional and personal issues. In order to continue this spirit of cooperation, it was decided to offer women engineering faculty lunches once a semester, to be coordinated through the WISE Program.

Speakers provided a presentation/discussion in the afternoon, open to all students. Sessions generally took the form of round-table discussions, due to the small number of students in attendance. The greatest number of attendees were in sessions which were heavily advertised in the CLAS. Speakers shared the professional and personal development that lead them to their current position. The stories were all very different. Christine Platt was in the midst of a job change and shared her dual career marriage struggles. Donna Chapple discussed the additional challenges she faced as an African American. Carol Kemelgor talked about stories she collected from the female engineering graduate students she interviewed for her research. Elcira Villarreal explained how she went from participating in the war in El Salvador to attending college in Texas. Joan Gosink described what it's like to be one of a handful of women engineering deans.

The speakers all encouraged students to aim high, and provided thoughtful answers to students' questions about marriage and families, finding mentors, office politics, negotiating for salaries, and sexual harassment. Student participants completed brief evaluations of the afternoon session. Evaluations were positive, indicating that these sessions were helpful and motivational.

The capstone of the Careers in Science Series, "What good is your Ph.D.?", was directed toward graduate students. This seminar included seven speakers from around the country in various fields of science and engineering. The speakers, all of which had earned a doctoral degree in engineering or science, included a Stock Market analyst a community college physics professor, an independent consultant a corporate president, a chemical engineering professor at a state university, a consulting firm partner, and the owner of a research company. The seminar focused on alternative careers for higher education graduates. The seminar was held on a Thursday in July and was a full-day event, including a hosted lunch. Fifty-two students attended this seminar.

Two problems emerged from the Careers in Science speakers series. First, student participation was disappointingly low, particularly for engineering students. Personal phone calls did increase participation, but such calls are energy intensive. Some of the speakers did not have engineering backgrounds, which may have contributed to the problem. Also, while the speakers' visits were evenly spaced throughout the semester, perhaps

concentrating the visits at the beginning of the semester would allow for more student participation before the mid-term "crunch" sets in.

The second major problem is finding funding to offer this program again. Providing airfare, lodging, per diem and honorariums for speakers is expensive, and program costs also included providing breakfasts and lunches for participants. The total cost for the Careers in Science series was approximately \$15,000. It is difficult to leverage this type of money from industry. However, the program could be modified and offered on a smaller budget. For example, local speakers could be utilized, and lunches could be paid for or subsidized by participants. Of course, local speakers do not tend to have the same impact as bringing a speaker in from another state. On the other hand, local speakers would have more experience with local companies, which may be

of more interest to students. Charging for lunch might decrease the already troublesome participation level. On the other hand, people tend to expect what they pay for and charging a nominal fee might help them to realize what a valuable experience they are receiving!

REFERENCES

1. Bandura, A. (1986). Self-efficacy theory in contemporary psychology. Journal of Social and Clinical Psychology, 4(3), 359-373.



