

## **THE ACCESS PROGRAM FOR WOMEN IN SCIENCE AND ENGINEERING (ACCESS WISE)**

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### **Access WISE: The Beginning**

The Access Program for Women in Science and Engineering (Access WISE) is a community outreach program for students in kindergarten to grade 12, and adults. The primary objective of the program is to encourage women to consider engineering and the physical sciences as viable future careers. As the Access program is by far the most active university outreach program at the University of Manitoba, a secondary goal is to foster an overall community understanding of science, engineering, and the university in general.

Access WISE began on May 1st 1990 as a pilot program jointly operated by the Faculties of Science and Engineering in response to a common problem: a lack of women pursuing areas that required physics and mathematics. Women were dropping high school mathematics and physics courses at a disproportional higher level than their male counterparts, and by in large not choosing to pursue engineering and the physical sciences even if they had completed the requisite high school math and physics. To reverse this disturbing trend and to encourage girls to see engineering and the physical sciences as accessible, Access WISE began its program of school visits. Two women students, one from science and one from engineering, were hired as presenters (Access co-ordinators).

Initially, these presentations were strongly targeted to students in grades nine to eleven. This is the time when students make crucial decisions about which courses to take in high school and what areas they will apply to at university. The purpose of these talks was to get the girls "excited and enthused" about engineering and science, to show them how important it is to keep their options open by taking high school physics and math, and to show them how these apparently dry and academic disciplines relate to "real life" concerns like job satisfaction, travel, salary, and job security.

During the program's first weeks of existence, it became obvious that attitudes about science are formed much earlier than grade nine and that no presentation, no matter

how engaging, will reverse these attitudes. The Access presentations were expanded to include grades 4 to 12 and demonstrations and experiments were added to enliven the talks to younger audiences.

The results from the first year of the program were so encouraging that what was intended as a one time only summer project was continued on into the fall term on a part time basis. Access WISE was expanded as requests from the schools for talks soon outstripped the availability of the Access Co-ordinators. In the spring of 1991, a year after the start of the program, additional co-ordinators were hired to meet the increased demand from the schools. The variety of presentations offered by Access WISE was increased to be more sensitive to the wide range of audiences, and the program began to grow into the shape that it now has.

Since its inception, Access WISE has continued to grow in its popularity, not only with the schools throughout Manitoba, but with other community groups such as Brownies and Girl Guides, 4 H Clubs, Science and Mathematics clubs, parent-teacher associations, women's groups and a host of others - both urban and rural. To date, co-ordinators have given over 3000 presentations to well over 120,000 students throughout Manitoba.

### **Community Specific Outreach Success**

It is impossible to talk about outreach without placing it in its proper context. A large part of the success of the Access Program has been that it endeavours to appeal specifically to distinct communities within the ethnically and geographically diverse province of Manitoba. From small farming communities on the flat expanse of the prairies in the south, to isolated mining communities on the Canadian Shield in the north, Manitoba is an amalgamation of many cultures and communities.

With over half of the population of the province living outside of the capital city of Winnipeg, the Access Program has placed a very special emphasis on its non-urban outreach. For many of the small communities, the contact with Access WISE is their first - and often only - exposure to university culture. To be effective at encouraging girls to consider science and engineering, Access presentations must address also their concern about relocating to an urban environment and study at an institution which is often perceived as being large and impersonal. To convey this information properly, the co-ordinators must speak to each community in its own language - in both a literal and a figurative sense. Whenever possible, Access presentations are given by co-ordinators with a background similar to their audiences. For instance, Franco-Manitoban co-ordinators are hired to speak to the French and French immersion schools, women who grew up in rural Manitoba speak to the rural farming communities, etc. This helps assure that the information provided by Access WISE is given in terms that the girls and women will understand and appreciate.

## **The Presenters**

All Access presentations are given by the Access Co-ordinators, who are women students of engineering or science. They are an interesting and well-informed group of women who are excellent communicators and motivational speakers. The rationale for sending out university students is twofold. First, as presenters, they provide positive role models that break the stereotypical image of male engineers and scientists. Second, as university students, the presenters are more apt to be perceived as peers by student audiences. The similar concerns and perceptions of audience and speakers add to the overall effectiveness of the presentation.

To provide outreach to the diverse Manitoban community, Access WISE strives to maintain a representative diversity in its staff. This co-ordinator diversity is not only based on ethnicity. For the presentations to older than average students, Access WISE employs co-ordinators who are themselves women who have returned to school after raising a family or working in industry, and therefore have first-hand experience of the specific demands that are placed on this group of students.

Access WISE provides in-depth training that addresses ways in which presentations can be made more involving for girls and women. This training is regularly reinforced and augmented with training sessions and in-house seminars.

The employment of students as co-ordinators helps fund and support women already pursuing careers in science and engineering. The Access Program operates in a very lively and supportive atmosphere. Many former co-ordinators have cited this environment as one of the factors that helped them "get through" their university education.

## **Access WISE Presentations**

Within the wide array of presentations given by Access WISE, a majority of presentations are directed to school children in grades 3 to 12, and amongst these, most are given to school children in grades 3 to 8.

### **Presentations to Students : Grades 3 to 12**

For students in grades three to seven, most presentations revolve around the "Science Roadshow", a collection of very dramatic visual demonstrations and experiments (examples include: a Tesla Coil, LASER, and liquid nitrogen) whose fascinating visual effects illustrate basic science and engineering principles. Roadshow demonstrations are interspersed into a general discussion about science and engineering where co-ordinators try to dispel the negative "nerdy" image of scientists and explain what engineers actually do. The focus of this presentation is how much fun science and engineering really are, and to show students that they are not fields reserved for the associated stereotype of white male geniuses with socialisation problems.

For the older students (grades 9 to 12), the presentations are designed to provide information about the wide range of career options that are available in both science and engineering. Career counseling is the primary focus of these talks, with the central theme being the importance of not limiting future choices through course decisions made while in high school. In rural and remote areas these talks are expanded to talk about university in general.

At the request of administrators and teachers, Access WISE has also designed other - more specialised - presentations on topics that directly relate to the Manitoba Department of Education science curriculum. Essentially for students in grades 3 to 8, these include:

- 1) States of Matter,
- 2) How to Prepare a Science Fair Project,
- 3) Geology: Identifying Rocks and Minerals,
- 4) Basic Chemistry,

These newer topics allow the Access Program to return to schools and address the same students each year without repeating information from a previous year.

A recent addition to Access WISE presentations is the "Water Resources Module" of lectures for grades five to eight. The senior co-ordinator, Laura Binkley, in conjunction with Brock Corydon School, and Dr. Barbara J. Lence, Department of Civil Engineering, has developed a module to teach children about water resources engineering. This educates students about the basic scientific concepts required to study water quality, while at the same time, it gives them an in-depth understanding of a specific field of engineering. The module is comprised of a computer program to model the in stream amount of dissolved oxygen, a series of nine lecture topics, transparencies for overhead projection, handouts, experiments, assignments and tests. The module will be available world-wide through the Canadian SchoolNet computer network.

Experience has taught us that, in many cases - especially at a younger age - it is better to give presentations to mixed groups of both girls and boys, but we will leave the final decision to the discretion of the teachers involved. Although not a hard rule, we have found that girls only groups work better in grades nine and ten, when girls, if alone, are far more likely to respond to a presentation or ask questions.

#### Other Groups

An important component of Access WISE is the PRIME (Progressively Returning from Industry, Motherhood, Etc.) Access program. The PRIME program targets presentations to women's groups to encourage older than average students to examine these fields when returning to school. The co-ordinators that give the PRIME presentations are themselves women who have returned to school after raising a family or being in the work force.

In response to requests from a variety of different sources, Access WISE also gives presentations to a number of groups outside the classroom. Parents, administrators, counselors, etc., also are concerned about the factors that influence girls away from the sciences. As the media reinforces the importance of math and science for future careers, these concerned individuals have turned to Access WISE as a resource for finding ways in which they can increase the participation of girls in those areas. At venues such as teachers' and administrators' conferences, parent-teacher group meetings, and university sponsored "information days", the senior co-ordinator of Access WISE gives presentations to such groups.

### **Access WISE: Program Structure**

The policies and objectives of Access WISE are established by a six member Access Advisory Committee, with representation from science, engineering and central university. The daily operation of the program is managed by the senior co-ordinator, Laura Binkley, the one full-time employee of the program. Ms. Binkley is herself a part-time engineering student. The supervision of the program is provided by the chair of the Access Advisory committee, a rotating position which is currently held by Ms. Irene Mikawoz, P. Eng. Director of Students Affairs for the Faculty of Engineering. Six to eight part-time co-ordinators - full-time women students of science or engineering - are employed to give presentations.

The program operates full-time during the months of May and June, and part time during the academic year from September to April. During the months of July and August, only the senior co-ordinator remains on staff. During these months, new presentations are developed for the following year, and a limited number of presentations are given to camps and day camps within Manitoba.

### **Accolades**

The success of the Access program has generated interest from a variety of sources. Co-ordinators have been invited to give presentations on local children's television programs, at the Winnipeg Children's Hospital, and to various groups at the Manitoba Museum of Man and Nature. In February of 1995, the Women's Television Network (WTN) taped a presentation given by the Access Program. Segments of this presentation, along with interviews with the co-ordinators and the children who watched the presentation, were aired on "Call Us" a program dealing with non-traditional careers for women.

The Access Program was chosen as the 1994 recipient of the Students Project Award. This is an annual prize given by the 1989 Canadian Engineering Memorial Foundation to a student, or group of students, actively encouraging the engineering profession through outreach. This award was presented at the Association of Professional Engineers of the province of Manitoba's (APEM) "Recognition Nite" on March 7, 1995.

The continued support of the Faculties of Science and Engineering and the central administration of the University of Manitoba - especially at a time when budget cutbacks have resulted in the loss many viable programs - is a further indication of the success of the Access program.

### **The Future**

In the future, the Access Program hopes to expand its presentations to better serve its constituency. To achieve this, finding a more permanent source of funding is of paramount importance. One way in which this goal is being accomplished is through the establishment of an endowment fund with support coming from private and industry sources.