

**The Hypatia Project:**  
**Promoting Nova Scotia Women in Science and Technology**

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Donna Clark  
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### **ABSTRACT**

Women continue to be under-represented in science and technology in Nova Scotia, the result of many years of systemic barriers and gender stereotyping. Not only have problems existed for a very long time, but they exist over the full continuum of women's lives. We are influenced by many factors, first as young girls in the school system and later as women in the workplace.

The Hypatia Project is based on the philosophy that sustainable solutions will be found only through the cooperative efforts of men and women, of business and industry, of government, education institutions, and communities. The Hypatia Project includes a diversity of initiatives in four program areas: the Workplace, the Public School System, Post-Secondary Education Institutions, and Communities. Ultimately the aim of the Hypatia Project is to build the capacity of participating agencies and institutions to ensure girls and women are well represented in science and technology. By integrating key program areas, the Hypatia Project will design and implement long term strategies to improve the representation of women in science and technology in Nova Scotia, and work towards sustainability of these strategies through changes within institutions.

### **BACKGROUND**

Individual members of the Hypatia team have been involved in many gender initiatives over the years, planning and coordinating special events and programs for girls and young women – in the school system, in post-secondary institutions, in the workplace. For some of us it is now twenty, even thirty years later and we are still dealing with the same issues. Women are not well represented in science and technology in Nova Scotia and the trends are not encouraging. We are constantly being told that the economy of Nova Scotia is growing and that a “new economy” is upon us. If this new economy involves science and technology and if current trends continue, Nova Scotian women will not be participating to the same extent as men. This will mean a continuation of inequity of access to higher paying jobs and a continuation of the significant discrepancy between the income for men and women.

The Nova Scotia Department of Education reports that, with some regional differences, females are participating in high school science and math programs in equal numbers as are males. But this equity in high schools enrollment does not carry forward to equity in enrollment in science and technology programs at post secondary institutions. Young women are choosing to enroll in alternative programs. Enrollment of women in many engineering programs has leveled off and in some cases has started to decline. Enrollment of women in science, engineering and technology training programs at the Nova Scotia Community College has declined in the past year to under 15% while the enrollment of men has increased. Enrollment of women in computer training programs at universities and colleges has declined, also in the 15% range. The proportion of female certified technicians and technologists in Nova Scotia is about 4%. Women constitute

only 5% of the membership of the Association of Professional Engineers of Nova Scotia. This is not a fast track to equality for women in Nova Scotia.

The consequences of this under-representation are significant. The cost to Nova Scotian women is great when they are continually denied equal economic opportunities in the higher paying science and technology workplace. There are costs to business and industries as well. Women seem more predisposed to a consultative and collaborative management style that is increasingly being acknowledged as the preferred approach for efficient and effective management. These consequences are compounded, resulting in long term costs to society as a whole. Women contribute a diversity of perspectives, a range of energies, and propose creative and innovative solutions which the new century and the “new economy” with new issues and problems in science and technology will require.

What’s happening? Why have the programs over the past two-three decades had such limited impact on the participation of women in science and technology?

Numerous studies have produced a substantial body of knowledge about the factors that dissuade girls and women from considering further study or choosing careers in science and technology. We know that gender-role stereotyping is a major barrier for women. We also know about the systemic barriers which exist for women who choose to pursue studies and careers in science and technology. The literature abounds with references about how stereotypic images and attitudes, institutional policies and practices, workplace culture, and instructional practices influence the participation of girls and women in science and technology. Yet most of the gender initiatives implemented in Nova Scotia over the past two decades have focused on the girls and women themselves. The message seems to be that if we properly prepare and motivate and support girls and women for science and technology, everything will be fine. Even with all the knowledge we have learned about the influence of systemic barriers, we continue to put the majority of our time, effort and funds into programs to change the girls and women, not the system. That’s a major burden to put on their shoulders!

The members of the Hypatia Team decided to initiate a project that designs and implements strategies for systemic change. We named our Project after Hypatia, an Egyptian mathematician, astronomer, natural philosopher and teacher who lived in the fourth century. Hypatia was a very practical inventor, designing tools for distilling water, an instrument to measure the specific gravity of water, and an astrolabe to measure the altitude of stars and planets. She was a notable exception to the traditional role of women in her time. She would still be an exception if she were alive today.

### **HYPATIA GOALS**

- To increase the participation of girls and women in science and technology in Nova Scotia.
- To promote the participation of Nova Scotian women in the policy development process within science and technology.
- To promote economic equality for women in Nova Scotia.

### **PROGRAM HIGHLIGHTS**

The Hypatia Project is still in its infantile stage having begun in January, 2000. The strength of the Project lies with the integration of the four program areas – School System, Post Secondary Education, Workplaces, and Communities – recognizing that systemic barriers exist throughout society and cannot be addressed through isolated, unconnected programs. The approach in each program area will be the same. Hypatia Working Groups will be established, equity audits will be conducted followed by the implementation of action plans, customized to meet the needs identified in the audit. Within each of the four program areas, strategies focusing on systemic change will be designed and implemented. Systemic change is essential to the sustainability of the Project, and to ensure long term impacts on the participation of women in science and technology in Nova Scotia.

The plan to conduct research or equity audits within participating institutions, workplaces, and communities is based on considerable evidence suggesting that articulation of gender equity strategies at multiple levels, from policy to practice is what moves institutions towards more inclusive and equitable learning and working environments. This approach is premised on the assumption that change is more likely to occur if the need is acknowledged at all levels and if there are coordinated institutional efforts to oversee the change process. While the available research can indicate typical patterns of inequity facing females in science and technology education programs and workplaces, the specific practices and policies at each institution need to be examined in order for reasonable action plans to be developed.

## **Public School System**

### **Objectives**

To build understanding about gender inequities and to change everyday practice among all those involved in the education process – teachers, parents, and school system administrators – so young women have equitable opportunities in science and technology education.

### **Approach**

In order to be effective, professional development must be continuous – one-day workshops or inservices for educators have corresponding short term impacts. The Hypatia Project will provide a series of professional development opportunities to achieve maximum effect.

During the first year, professional development strategies with direct application to the classroom will be implemented and gender equity training for teachers and administrators will be provided. Also, assistance will be provided to the Hypatia Working Groups in developing an equity audit to identify barriers which exist within schools preventing young women from having equitable experiences in science and technology classrooms. Subsequently, strategies will be developed and implemented to reduce the identified barriers, and to create a learning environment which is supportive of the participation of young women in science and technology.

## **Post Secondary Education Institutions**

### **Objectives**

To support and retain women in science, engineering and technology programs in the post-secondary sector by developing and implementing change strategies in institutional practices, policies and attitudes.

### **Approach**

The approach is premised on the assumption that change is more likely to occur if people can see the need for change and if there are coordinated institutional efforts to oversee the change process. The approach at each site will be collaborative, and will begin as an action research project, an equity audit conceptualized and carried out by faculty and students, and overseen by the Hypatia Working Group at each site.

Workshops will be held at each campus to increase the awareness of gender issues in education for science and technology, and from this awareness base, members of the Hypatia Working Group will develop and implement the equity audit strategies. The intention of the workshops is to raise awareness of the issues, to assist each institution in developing its procedures for equity assessment, and to establish a work plan for implementing the assessment. The equity audit itself will include, but not be limited to, examining: androcentrism in texts; inequities in lab participation; the range of pedagogical practices used by instructors; the existence of social norms that shape relationships among students and between students and faculty that might undermine support for female students; the availability and implementation of sexual harassment policies. These investigations will be carried out both by documenting women's experiences (what's it like to be a female here?) and by studying specific institutional practices.

## **Workplace**

### **Objectives**

To increase the number of women recruited into positions requiring a science and technology background, to retain women already in science and technology positions, and to ensure ongoing opportunities for advancement for women in science and technology positions throughout business, industry and government workplaces within Nova Scotia.

### **Approach**

Individual organizations can become workplaces of choice for women working in science, engineering, information technology or mathematics. This will be achieved by first identifying and then changing systemic issues within workplaces that act to discourage or prevent women from entering science and technology positions, particularly policies

or procedures that relate to recruitment, retention, and promotion of women. Supportive and welcoming workplaces, with role models within them, will serve as attractive beacons for women making the transition from university/college to the workplace. Women, by being supported in developing greater levels of leadership, personal power and self expression, will become more active in workplaces and will move to positions of influence within their professions.

Women in science and technology positions within the participating workplaces will be provided with new information, as well as facilitated workshop support and individual coaching, with the aim of increasing their understanding and developing more resourceful behaviours that would support them in becoming strong leaders, more personally powerful and more able to express their opinions and needs in their workplaces - including the need to occupy positions of power and influence within the science and technology community.

## **Community**

### **Objectives**

To develop a community environment which encourages young women in science and technology by creating positive public perceptions about science and technology and about the role of women in science and technology.

### **Approach**

The influence of the community goes well beyond the role of parents. The Hypatia Project will act as a catalyst for the formation of a Community Working Group which will identify and then link with community initiatives and activities related to science and technology. Science symposia will be organized where keynote speakers from business, industry, community colleges, universities and a variety of professions will discuss the ways they use science professionally. They will lead students, parents, teachers and other community members in activities which will help to change the negative perceptions often held of science and technology. The aim is to promote a better understanding of the pervasive role of science and technology in everyday occupations and professions. It is important that community members become more knowledgeable about the role they can play in encouraging the participation of young women in science and technology through activities, for example, such as job shadowing and mentoring.

## **CURRENT STATUS**

### **Hypatia Forum**

The first Hypatia Forum will be held on May 4-5, 2000 in the Annapolis Valley region of Nova Scotia. A report on the Forum will be presented at the CCWEST Conference in July, 2000. The theme of the Forum is:

*Keeping Girls and Women in Science and Technology: Exploring the Issues and Opportunities*

### **Forum Goals**

- to enhance our awareness and understanding of issues influencing the participation of girls and women in science and technology in Nova Scotia
- to develop site specific action plans designed to take stock of gender issues and opportunities in science and technology

The Forum will combine presentations with work time and small group discussions. By the end of the Forum, participants will have prepared the first draft of a plan or strategy to take stock of gender issues and opportunities at their sites. The nature of the issues to be examined and the approaches used will be determined by the participants. Within a year, it is anticipated that the taking stock process will be completed and strategies for change will begin to be implemented. The Hypatia Team will continue to work at each site throughout this period.

### **Approach**

During the Forum, we will be using Open Space Technology through which we believe is a route to very productive sessions. All issues of concern to any participant will be on the table and all issues will be discussed to the extent that participants choose to do so. Priorities will be identified, related issues converged, and the initial steps towards action plans will be taken.

**Participants**

Hypatia Forum will be attended by representatives from the Annapolis Valley Regional School Board, the Nova Scotia Community College and local communities, as well as members of the Hypatia Team, and our sponsors, Nova Scotia Power and Sable Offshore Energy Inc.

After several months, a second Forum will be held to compile information gathered in the various research projects and identify where joint action can be taken, joint programs developed, and resources shared. The programs will depend on the needs identified through the research.

**Sponsors**

Currently, the Hypatia Project is entirely funded by private sector corporations. Our sponsors are Nova Scotia Power and Sable Offshore Energy Inc. There are ongoing discussions with other potential corporate sponsors.

The Hypatia Project has also received significant support from the Nova Scotia Community College and the participation of the Annapolis Valley Regional School Board. The Nova Scotia Advisory Council on the Status of Women has been a significant advisor as have members of ANSWERS – Association of Nova Scotia Women for Education and Research in Science.

**The Team**

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