



A REPORT OF THE STATE EMPLOYMENT & TRAINING COMMISSION'S
COUNCIL ON GENDER PARITY IN LABOR & EDUCATION

**Women in New Jersey's Science and
Technology Workforce Summit
June 8, 2007**

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New Jersey's Council on Gender Parity

Established within the State Employment and Training Commission (SETC), the New Jersey Council on Gender Parity is the only one of its kind in the United States created by legislation to address issues of gender disparity in labor and education. It first met eight years ago and has provided the state with leadership on gender equity issues important to its economic and workforce development. The agenda for the work of the Council was set at its first meeting, including a review of occupations with both gender barriers and identified labor shortages in New Jersey. Five critical fields identified in an early report for the Council are building trades, financial services, health care, law, and technology. Since that time, the Council has published 12 reports, made numerous policy recommendations, and held 6 public forums covering three of the five areas – building trades, health care, and technology. Copies of Council reports are available on the SETC web site (www.njsetc.net).

The Gender Parity Council also allows gender equity experts to work directly with state agencies to assist them in the implementation of programs that attend to the needs of women. This is a unique role that does not exist in any other form in our state government. Through these and other initiatives, the New Jersey Council on Gender Parity in Labor and Education has made tremendous strides in the advancement of equity in the State.

Center for Women and Work

As the research arm of the Gender Parity Council, the doctoral-level staff at the Center for Women and Work has collected data, conducted research, and produced reports and public forums for the Council, and also makes presentations within the state and on the national level about the Council. The CWW also works closely with the New Jersey State Employment and Training Commission (SETC) and the Council to follow occupational trends in New Jersey and identify current or potential inequities.

Event Host: Office for the Promotion of Women in Science, Engineering and Mathematics at Rutgers University

Established in the Fall of 2007, this office engages in an inclusive program to promote the entry and progression of women in the science, technology, engineering, and mathematics (STEM) professions. Led by Associate Vice President, Professor Joan W. Bennett, and Associate Director, Dr. Catherine Duckett, the office works with students, staff, and faculty to encourage women at all levels of their careers to reach their maximum potential. Campus-wide initiatives include recruitment, mentoring, networking, research, sponsorship of lectures, and other activities that support both men and women in the STEM professions. The June 8, 2007 summit on engaging and retaining women in the science and technology workforce was the office's first event to reach outside of the university community.

Overview:

Women have made tremendous inroads in the science and technology workforce over the last several decades. They have increased their participation in science and technology education at both the secondary and post-secondary levels, and have increased their representation in many occupations within these fields in the New Jersey workforce. The New Jersey Gender Parity Council has addressed the issue of women's participation and advancement in the science and technology fields since its first meeting in 2000, including hosting several outreach events, and publishing research reports such as *Engineering Their Futures* (2002), and *Bridging the Gap: Women in Science, Engineering and Technology* (2001). Despite the attention the issue has seen from the national media, researchers, and policy makers, there continue to be sectors of the science and technology fields where women remain woefully underrepresented.

Governor Jon Corzine's strategy for economic growth includes several priorities that focus on science and technology, including developing a world-class workforce and nurturing the development of new technologies to ensure that the state continues to be a leader in innovation (Corzine, 2007). A report from the US Department of Labor's Bureau of Labor Statistics predicts that the science, technology, engineering and mathematics (STEM) occupations are projected to grow 22 percent from 2004 to 2014, creating 2.5 million jobs. These jobs are also high paying—STEM workers earn about 70 percent more than the typical worker (Bureau of Labor Statistics, 2007). Women's participation in these fields is critical to New Jersey's workforce development as the increase in their numbers can help fulfill the demand for this highly skilled workforce.

With the potential for high-paying, high-demand careers, the question of women's under representation in STEM fields becomes increasingly complex. A recent report from the National Academy of Sciences showed that women have the ability and drive to succeed in science and engineering, but those who are interested in STEM careers are lost at every educational transition, and the problem is not simply the pipeline but goes beyond it into the workforce itself (National Academy of Sciences, 2006). In order to avoid recommending solutions that address only one component of the STEM workforce equation, the Gender Parity Council proposed a one-day summit which brought together representatives from each element of the equation. The combination of educators, industry representatives, community organizations, researchers, government and policymakers at work on the issue at the same time with equal parts in the conversation, would create much stronger recommendations for success.

First Annual Summit on Women in New Jersey's Science and Technology Workforce

On June 8, 2007 the Office for the Promotion of Women in Science, Math and Engineering at Rutgers University hosted almost 200 people in Traves Hall at the Douglass College Center for the New Jersey **Gender Parity Council's Summit on Women in New Jersey's Science and Technology Workforce**. Representatives from government, industry, K-12 schools, academia, and community-based organizations gave up a spring Friday to participate in a dialogue on women's participation in this important sector of our economy. The event was organized into two main parts: morning informational panels and plenary discussions, followed by an afternoon of small group breakouts where participants tackled specific topics related to increasing women's recruitment, retention, and advancement in these fields. The final session brought all participants together in a plenary session where they answered five key questions about the next steps towards reaching the goal of an equitable science and technology workforce.

In the first plenary session, **Policy in New Jersey**, participants heard from government and policy-makers on current policy initiatives in the state that have a direct impact on the science and technology workforce. Panelists included Jane Oates, Executive Director, NJ Commission on Higher Education; Marilyn Davis, Deputy Commissioner, NJ Department of Labor & Workforce Development; Angie McGuire, Deputy Chief, NJ Department of Economic Development; and facilitator, Dianne Mills McKay, Chair of the Gender Parity Council. It was clear that New Jersey's economic development is invested in the science and technology sector, and that the state has several progressive initiatives that are working to ensure equal access to these high-skill, high-pay jobs.

The second morning panel, **The View from the Field**, featured industry representatives and researchers who provided an overview of the workforce itself, including issues of work-life balance, as well as successes and challenges in recruitment and retention programs. Panelists included Pamela Stone, PhD, Professor, Department of Sociology, Hunter College, author: *Opting Out? Why Women Really Quit Careers and Head Home*; Michelle Tortolani, Senior Director, XM Satellite Radio, President-Elect, Society of Women Engineers; Laurie Brooks, Vice President, Public Service Electric and Gas; Kathryn Uhrich, PhD, Professor, Department of Chemistry, Rutgers University; and facilitator Aleta You, PhD, New Jersey Statewide Systemic Initiative, Rutgers University.

The lunch session featured the keynote speaker, **Dr. Nancy Snyderman**, Chief Medical Editor for NBC News. She spoke of her personal experience as a woman in science, as

well as her unique perspective of the workforce as a national media correspondent in one of the major sectors of the science and technology fields. Participants left this session ready to break out into their working groups to discuss specifics.

Breakout Sessions:

In the afternoon component of the summit, participants were organized into five breakout sessions which focused on different aspects of the science and technology workforce. These topics were determined by the members of the planning committee. Each session was staffed with discussion leaders whose responsibility was to facilitate discussion amongst participants and to create a list of recommendations for increasing women's participation and advancement in science and technology fields (see attached description).

Recruitment and Retention of Women in Science and Technology Industry

This session featured discussion leaders from industry, professional organizations, and higher education. There was a good deal of discussion of examples of successful programs, as well as the continuing challenges faced by industrial and academic professionals.

Session participants outlined the following recommendations for next steps to be taken at a state-wide level:

- Create an electronic portal to provide links to resources and programs available through industry, professional organizations and academic institutions for programs. Examples include summer internship programs for students or teacher-education internships with industry.
- Develop a resource guide for distribution to students about existing experiential learning programs, such as summer internships, camps, or co-ops.
- Provide best practices regarding diversity initiatives within organizations. While larger corporations have diversity initiatives instituted, it would be helpful to all organizations (small and large) to be provided with information about the value that workforce diversity brings to organizations as well as sharing of program information among organizations.
- Develop a targeted information campaign focused on parents and community members about the significance of technology literacy.
- Inform employees of their rights regarding discrimination to assist those who may experience it with a way to verbalize their experience and recognize that they need not just accept it as the way things are.

Media and Cultural Perceptions of Women in Science and Technology

Participants in this session discussed the role that our culture plays in women's participation and advancement in science fields. Topics included an analysis of popular TV shows and movies that feature gender stereotypes or nontraditional role models, and the effect that has been seen in the workforce as a result (e.g. the popularity of the CSI series and the increase that has been seen in both boys and girls' interest in forensic science careers). Another topic was whether or not the media has the responsibility of encouraging girls in science and math careers. In discussions of what participants would like to see with the media, striking a balance between the elements that drive the media business (money, "newsworthy" stories), and the objectives of those who are advocating for cultural change. Other suggestions included using celebrities and the forms of media that are most influential with youth, such as Podcasts, graphic novels, and music—some of which are not as rigid as traditional TV and movies.

Work-Life Balance

This session was attended by both policy-makers, industry leaders, and science and technology professionals, and therefore had a diverse group for discussion. When defining work-life balance issues, participants made it a point to differentiate between "time" issues (i.e. not enough hours in a day), and "presence" issues (i.e. can't always be at the right place at the exact time they are expected). This was seen as a critical element in the crafting of work-life balance policies, as a truly flexible schedule could resolve the presence issue but not time, and simply cutting back on hours might not resolve a presence issue.

Suggestions for policies that employers can implement to address work-life balance, included:

- flexible scheduling,
- day care at the workplace,
- implementing maternity and family leave policies,
- allowing work from home when possible,
- creating equal opportunities for women ,
- increasing levels of respect for women,
- creating "professions with passion" to attract women's desire to help people,
- and starting women in smaller companies where there may be more flexibility.

Interestingly, all session participants felt that flexible scheduling was a viable option for all workplaces—despite popular wisdom that states that many of these fields could no longer be competitive if options such as this were instituted.

Perceptions of Career Pathways in the Sciences

This session discussed the paths through education and experience that can lead to the variety of career opportunities in science and technology. The participants' responses to what ways the different sectors (education, industry, government) can better communicate career opportunities in science, math, engineering and technology to girls and young women yielded several suggestions. Some of the measures suggested were:

- Create a two-way partnership between industry and institutions that gives more practical knowledge about the work environment and work opportunities.
- Change the academic culture so that outreach is as legitimate as research in terms of tenure ratings.
- Add more STEM areas to Science Exploration programs (e.g. RUTGER'S Science Exploration Bus) to show the breadth of opportunities.
- Excite young people about science and tech careers by signing on volunteers who will promote education careers in STEM, and use youth-friendly applications like MySpace and Facebook for interaction.
- Modify teaching certifications to allow people from science and technology professions to teach.
- Utilize collaborative resources such as the state colleges (e.g. for digital library), and sustain support of cyber infrastructure from www.NJedge.net to house knowledge.
- Create more K-12 programs that support teaching fellowships for graduate students in STEM disciplines.

Recognizing the importance of the role that K-12 science classrooms play in the perception of careers, participants also discussed the best ways to structure the teaching of science and came up with the following recommendations:

- Introduce career programs or some special programs into the classrooms.
- Relate the course of the study to practical situations. We shouldn't always rely on the laboratories for the experiments but also the open environment can be used for the same. This brings more hands-on experiences at all levels of education.
- Start restructuring education early and from the young student's experience.
- The academic curriculum should be more project-based than theory-based, and should be integrative (i.e. Math, Writing, Science, Social Studies) especially in elementary schools.
- Motivate female students by mentoring with older students and teachers.
- Counteract the issue of lack of parent involvement that can be due to language barriers, dual earning parents, single parents/guardian families, and more. Meet with parents and provide information about their influence on career decisions.
- Create more experiential learning opportunities like science fairs so that girls and other underrepresented students get acquainted with science and maintain their enthusiasm.

- Create a science seminar semester course where each student is assigned a research project on a relevant science topic.

Mentoring, K to Gray

Discussion in this session centered on the role that mentoring plays in recruitment, retention and advancement of women in the sciences, as well as key elements of successful mentoring. Participants mentioned the critical need for mentoring at transition points (e.g. from graduate work to the workforce), and for advancement (e.g. from junior faculty member to tenured professor). Session members mentioned several recommendations for optimizing mentoring, including:

- Institutionalize formal mentoring programs to counteract the natural tendency to mentor those who are similar to you, and encourage mentoring across racial and gender lines.
- Dedicate institutional resources (funding, staff time) to the creation of opportunities for informal mentoring opportunities.
- Before the mentoring relationship begins, ensure that both the mentor and the mentee know what to expect from the relationship. Provide formal training for mentors.
- Mentor K-8 science teachers by promoting / funding development of partnerships between K-8 science teachers and career scientists. For example, career scientists bring content, enthusiasm, and excitement for the subject matter. Recruit top retiring career scientists for these partnerships.

Creating Our Action Plan-- Five Questions:

For the final component of the summit, participants gathered in a plenary session to answer five key questions to guide the work of the Council on Gender Parity as it moves the agenda for women in science and technology forward. The following is a summary of the participants' responses to each question.

- In education, what do you believe is the single most important factor influencing girls/women's interest and persistence in STEM (Science, Technology, Engineering & Mathematics) curriculum?

The most popular response was mentors and role models, with 36% of responses. This choice was followed closely by co-curricular activities and hands-on experiences, and exposure to science and technology fields at an early age (with 20% and 19% of responses, respectively). Classroom climate and parents' influence had some attention, but the least popular response was Resources.

- At what point should science and technology career education begin with students in order to counteract gender stereotyping?

This second question was added to help guide recommendations for when policy intervention should start. Responses were quite clear that the earlier the intervention, the better. Eighty-six percent of respondents indicated that this education should begin at either the pre-school or early elementary levels, with a small number indicating late elementary.

- What is the best strategy for encouraging females or underrepresented students to consider STEM careers?

Of the four optional responses, the most popular choice was “Career development programming or curricula that emphasize exploration,” with 52% of the responses. The other responses, “Mandatory training of all teachers on gender equity and career development”; “Curriculum requirements”; and “Programs for parents and community,” all received equal votes from the remaining respondents.

- In the workplace, what do you believe is the single most important factor influencing women’s success (or lack thereof) in their field?

Respondents then turned their attention to the current workforce with the above question. The most popular response in this topic was “Workplace climate” (37%), surpassing responses for “Work hours/flexible choices” (18%), and “Mentoring or gender initiatives” (16%). “Family care support initiatives” received 12% of responses, as did “Sexual Harassment.” The issues of a critical mass of women workers/role models only received 4% of responses, and no one selected “Innate ability” — a definitive negation to the media attention on biological differences between men and women when it comes to ability to do science.

- What is the most important thing that the Council on Gender Parity in Labor and Education should recommend to the state of New Jersey with regards to this topic?

The responses in ranked order:

- Media / ad campaign on the "Science Cool" factor (27%)
- Teacher training (content and pedagogy) (19%)
- Legislation which strongly enforces equity in education and the workplace (19%)
- State-based incentives for workplaces with exemplary policies (18%)
- Community education on gender and career development (13%)
- More focused research (3%)

The lack of emphasis on more focused research showed that the summit participants felt there was sufficient information on the topic, and they placed their importance on action.

Summary

Event participants provided clear recommendations for the Gender Parity Council's agenda for women in STEM fields in the coming years. Although summit participants represented various stakeholders from education, research, industry, government and policy-making, they all came together on the agenda of creating a more diverse STEM workforce in New Jersey. Their expertise and diverse viewpoints helped the Council form a more complete picture of the issues, and therefore make comprehensive recommendations.

Because of the complexity of the issues discussed in this event, the Council created a subcommittee for women in the science and technology workforce. Subcommittee members include representatives from K-12 education, state-agencies, higher education institutions, and professional organizations, science and technology industries in the state, amongst others. The committee's first charge was to host an event which would again bring together key stakeholders to continue the conversations started at the first annual summit. This committee will also continue to use their expertise to make recommendations to the Council regarding its agenda on this critical sector of New Jersey's economy.

APPENDIX A

FACILITATED DISCUSSION SESSIONS

1:30 to 2:45 PM

Summit participants will choose one of the following five discussion topics that are critical issues related to women's engagement in the science and technology workforce:

Mentoring Women: K to Gray
Perceptions of Career Pathways in the Sciences
Work/Life Balance
Recruiting Women into Science and Technology Careers
Media and Cultural Perceptions of Women in Science and Technology

Each topic has assigned **Discussion Leaders** who will facilitate responses to a set of questions that session participants will answer as a group. The first set of questions will be answered by all breakout sessions, and reviewed in the Round-up Session (see below), and the second set are specific to the breakout session topic.

Once the Discussion Leaders and the questions have been introduced, session participants will break into smaller discussion groups of no more than 8 individuals, each choosing a recorder to take down their responses to the questions.

The first 15 minutes of the discussion will be dedicated to answering the **overall** summit questions. We will be using the Meridia Audience Response system to show the summary of responses for all summit participants, so **answers to these questions should be one word or short phrase**:

- In education, what do you believe is the single most important factor influencing girls/women's interest and persistence in STEM (Science, Technology, Engineering & Mathematics) curriculum?
- At what point should science and technology career education begin with students in order to counteract gender stereotyping?
- What is the best strategy for encouraging females or underrepresented students to consider STEM careers?
- In the workplace, what do you believe is the single most important factor influencing women's success (or lack thereof) in their field?
- What is the most important thing that the Council on Gender Parity in Labor and Education should recommend to the state of New Jersey with regards to this topic?

After the first 15 minutes are up, a runner will come to each session to collect the responses for the Round-up Session.

Discussion Leaders will use the rest of the time to facilitate responses to the questions specific to their topic. There is one **Session Recorder** assigned to each topic. S/he will take notes on the main points of the discussion in response to the questions that the participants are asked to answer. S/he will circulate through the room, taking overall notes, and will compile them into one document made up of each table's notes and their own for the overall session.

Session Specifics:

Work/Life Balance:

Discussion Leaders:

Terri Boyer, Rutgers University, (PC)*
Gilda Paul, Princeton University (PC)
Joan Girgus, Princeton University
Mary Gatta, Rutgers University
Pam Stone, Hunter College

Mentoring: K to Gray:

Discussion Leaders:

Catherine Duckett, Rutgers University (PC)
Bonnie Diehl, Farleigh Dickenson University (PC)
Stan Dunn, School of Engineering, Rutgers
Vita Rabinowitz, Vice Provost, Hunter College.
Marie Simone, Farleigh Dickenson University
Helen Wronski, Girl Scouts Chair of Girl Scout Council of NJ

Career Pathways:

Discussion Leaders:

Ellen Mappen, National Center for Science and Civic Engagement (PC)
Elizabeth (Tibby) Posillico, Elusys Therapeutics (PC)
Tanya Borsuk, Graduate student in Engineering at Rutgers
Holly Crawford, Rutgers University School of Engineering
Karen McCourt, West Morris Mendham High School

Media and Cultural Perceptions of Women in Science and Technology:

Discussion Leaders:

Dianne Mills McKay, NJ Council on Gender Parity (PC)
Lynn Fleming, New Jersey Department of Environmental Protection
Mary Hartman, Institute for Women's Leadership
Nancy Snyderman, NBC News

Recruiting Women in Science and Tech Careers:

Discussion Leaders:

Forough Ghahramani, DeVry University (PC)
Kay Axt, Accenture
Bill Healey, Healthcare Institute of New Jersey
Judith Sheft, New Jersey Institute of Technology
Frank DeLosReyes, Merck, Inc.

** PC= Planning Committee Member*

Recorders:

Pamela Yuen
Smitha Ganjam
Mohiti Arora
Tiffany Slotwinski

Dr. Geetha Gai

