

# **Building on Success: Increasing the Percentage of Women Faculty in the Sciences**

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## Abstract

The percentage of women in undergraduate and graduate science programs has increased dramatically over the past 20 years, but this success has not been reflected in the representation of women in faculty positions. Of considerable concern is that there has been little change over the past 6 or 7 years with the percentage of women faculty in the physical sciences and mathematics stalled at about 15%. New administrative positions are being created to effect change. As the first incumbent in such a position, Associate Dean of Science, Diversity, at the University of Alberta, I am implementing some of the principles, ideas and practices which have been suggested by many researchers and activists in the field to counter the factors which cause the continuation of low numbers of women faculty in the sciences. This has provided me with a unique experience: to see at first hand the cultures of the Departments which comprise the Faculty of Science and how these very different cultures affect hiring practices, promotion and retention of women faculty. Initiatives to date have included discussion sessions with Department Chairs and with all hiring committees, finding ways of identifying potential female candidates and inviting them to apply, implementing an effective mentoring program for new faculty, and lobbying for adequate high quality day care spaces on or near campus. Longer term strategies include having sessions with female graduate students, postdoctoral fellows and research associates in each Department in which women are markedly under-represented, and maintaining contact with women who complete their undergraduate degree at the University of Alberta and who go on to graduate school at other universities. It is also necessary to retain the women who have been recruited by creating a welcoming and supportive Departmental environment so that the women are more likely to stay and have successful careers in the academy. The initiative has been named "Project Catalyst"; the results to date are described.

## Introduction

The representation of young women in first year undergraduate science programs in North American Universities has increased over the past 20 years to 52% mirroring their percentage of the population. How did this change occur? Considerable research has been undertaken to try to understand the factors which influence women's choice of a career in the sciences<sup>1</sup>. Not surprisingly, many factors have been identified. Societal norms have changed over the past 20 years such that women are entering career fields which they used to not consider. Many groups have been established at the local level to take action to inform and excite girls from elementary to high school about the sciences, to introduce them to role models and to publicize and celebrate the contributions women have made in this area. For example, in 1982, Women in Scholarship, Engineering, Science and Technology (WISEST)<sup>2</sup> was formed at the University of Alberta and

in 1987 the Canadian Coalition of Women in Science, Engineering, Trades and Technology (CCWESTT)<sup>3</sup> was established to enable communication and empowerment among the groups.

These initiatives have had a marked effect on the number of young women entering post-secondary education in scientific and technical fields. In the academy, it was expected that as these young women completed higher degrees and gained postdoctoral experience in their discipline, they would become faculty members in the sciences. However, at the University of Alberta, in spite of the equal proportion of undergraduates, and the increasing proportion of female graduate students, the percentage of women faculty in Science has remained almost constant at about 15% for the past seven years. Thus, the expected increasing movement of qualified young women into faculty positions has not occurred. To take action to change this situation, in 2005, a new position of Associate Dean, Diversity, was established in the Faculty of Science. The mandate of this Associate Dean is to take action to increase the representation of women as faculty members, and also that of the other three “designated groups” identified by the Federal Government as being under-represented in the work-force, often markedly so in the sciences. In addition to women, these groups include persons with disabilities, visible minorities and aboriginal people.

As the first incumbent as Associate Dean of Science, Diversity, my activities to date have been focused on increasing the percentage of women in faculty positions. It is expected that at least some of the strategies effective in increasing the participation of women will also increase the inclusion of members of the other designated groups. To achieve this increase, I am using some of the principles, ideas and practices which have been suggested by many researchers and activists in the field<sup>4</sup> to counter the factors which result in the low numbers of women science faculty. Some of these practices include discussion of the issues with Department Chairs in the Faculty of Science, identifying women as potential candidates for positions, being a member of selection committees, facilitating effective mentorship of new faculty, ensuring implementation of policies which make the workplace more inclusive of women, and employing strategies which will have an effect in the longer term such as discussions with graduate students and post-doctoral fellows, and being involved in workload/worklife issues at the University. I have called the initiatives, Project Catalyst<sup>5</sup>. They are described in more detail in the following paragraphs.

#### Discussions with Departmental Chairs

Chairs of Departments in the Faculty of Science at the University of Alberta have considerable influence in their Departments so one of my first actions was to have an information and discussion session with all of them. It was important for them to know about my activities and be supportive of them. We discussed the reasons why diversity of faculty is important and talked about the different approaches women bring to research problems leading to invigoration of research teams and more robust solutions. It was acknowledged that with the strong hiring happening at the University of Alberta, the time was opportune to attract outstanding young women. As new Department Chairs are appointed, I talk with them about the initiatives.

## Identifying Potential Female Candidates for Faculty Positions

Identifying and personally inviting qualified women to apply for specific positions is a strategy which has been shown to be effective in increasing the pool of female candidates. Identifying such women can be difficult; I have talked with people in the field to ask if they know of appropriate women to approach. When at technical conferences, I take note of award-winning women and female presenters of papers. For example, at the Joint Mathematical Meetings<sup>6</sup>, the Association for Women in Mathematics<sup>7</sup> invites a select group of young women who are just completing their Ph.D. degrees to give oral and poster presentations. This provides an excellent opportunity to meet these women and know the area of their research, so that they can be invited to apply for appropriate faculty positions in the Department of Mathematics and Statistics or for postdoctoral fellowships at the University of Alberta. Personal contact of selected individuals is more effective in encouraging applications than sending out E-mails to large numbers of people. However, it is also good to send out the position notice to networks of women in the field. What is more difficult in the latter approach is knowing whether it attracted any additional female applicants and how effective it is. We cannot ask the gender of an applicant and names often do not allow such identification. Thus, unless reference letters are required with all applications and the referee refers to the applicant as she or he, it is often not possible to know the percentage of female applicants (and even more difficult to know the percentage of applicants in the other three designated groups) for any particular faculty position.

## Selection Committees

I am privileged to sit on many of the selection committees in each of the seven Departments in the Faculty of Science (Physics, Chemistry, Mathematical and Statistical Sciences, Computing Science, Earth and Atmospheric Sciences, Biological Sciences and Psychology). This has allowed me to understand how the Faculty guidelines for the selection and hiring of faculty members are implemented in each of the Departments and to recognize ways in which the hiring process is inclusive of under-represented groups. These committees begin their work by writing an advertisement for the position available. Women often do not apply for a posted position since they believe that they do not meet the advertised criteria. Thus, the wording of these advertisements can have an influence on how many women apply. For example, a small change such as “the candidate should have an outstanding research and teaching record” to “the candidate should have an excellent research and teaching record”, can avoid having a potentially strong female candidate decide not to apply since she did not judge her record to be outstanding. We know that young women tend to underestimate their achievements compared to young men and so in their subjective judgment they self select themselves out of applying for positions for which they may be just as qualified as those who do apply.

At the first meeting of each hiring committee, I present a set of notes intended to help to make the process more inclusive and to share with the committee members the resources available to support diversity in hiring. Many of the points in the notes were taken from information on inclusive hiring practices published on University web sites by equity advisors and others

working on equity programs. Some of the points in the notes which lead to discussion with the members of the selection committee include the following:

- Messages which would normally be communicated to candidates during visit:
  - Seriously interested in candidate's scholarly work and credentials
  - The Department of ..... at the University of Alberta is a good place to be since it is intellectually stimulating
  - The University of Alberta has a number of family friendly policies in place, e.g. day care; parental leave; human rights policies; desire for diversity
- How these messages are communicated to candidates can make a difference in recruiting women to departments where they will be outnumbered by male colleagues
  - Make it clear that the Department is interested in the candidate's scholarship and skills; quality will not be compromised to increase diversity
  - Consider how the Department will show that it is a place where women faculty can thrive, e.g.
    - Clear policies for evaluation and promotion
    - Sensitive mentorship
  - Schedule interviews and events with consistency, allowing equal time for each candidate to meet with the same personnel wherever possible
  - Give candidates a chance to interact with the Department's faculty in multiple venues. Formal talks may not reveal every candidate's strengths. Consider including less formal question and answer sessions
  - Focus on the candidate's ability to perform the functions of the job and avoid making assumptions based on sex, marital or familial status
  - Use a set of common questions for all candidates; e.g. provide information about family friendly resources to all candidates, not just women
  - Introduce all candidates to some or all women members of the Department
- When making final choices, need to constantly examine whether judgments on candidate's accomplishments and potential are being affected by subjective factors, stereotypes or other assumptions, e.g. a person who is a good fit with the current "norm" of the Department and who will blend in with existing structures is judged on their potential while someone who does not is judged on their accomplishments.
- Good to have short list of candidates without labeling one as "most promising" so that all candidates on the short list can be fully considered.
- There is a Special Recruitment Fund for attracting members of the four designated groups, women, aboriginal people, persons with disabilities, members of visible minorities and an Employment Equity Discretionary Fund to support projects that meet recommendations for the University of Alberta's Employment Equity Plan or to support any special measures stipulated by the Federal Contractor's Program.
- There is also a Spousal Employment Fund to aid spouses in finding suitable employment and Career and Placement Services has a Spousal Employment Program.

Observing the practices of about twenty selection committees has allowed me to identify what I would define as best practices in making the hiring process inclusive. I have found that asking questions about why a certain process was followed has helped those on the committees to see how some of the accepted practices may favour candidates who are in the traditional mould. Understandably, committees would like to hire persons who have an easily recognized record in their field, but this may mean that the committee misses the “rising stars” especially those who belong to groups not strongly represented in their Department. It is expensive and time consuming to bring for interview more than three or four candidates for each position, and since application packages can be difficult to judge, it is important that the committee be ready to take a risk in making the final selection of the short list for interview. At our University, there are funds available from the Equity Office to bring in a candidate from one of the four designated groups who would not otherwise be invited for interview. This can help to increase both the recognition of the viability of non-traditional candidates and their visibility.

Sometimes, I have been able to question the practices of selection committees which appear to be discriminatory to women, even although not intended as such. I have also tried to uncover some of the systemic biases which help to account for the low proportion of women being hired. I have found that this is best done by relating examples of how our biases can affect our judgment. One question that I have found useful is asking how a selection committee would subconsciously react to an obviously pregnant young woman compared to a young man about whose family they know nothing, since again, we may not ask. I have tried to ensure that diffident yet brilliant young woman is not at a severe disadvantage when compared with a self-confident young man who presents himself extremely well. Knowing that examples of unintentional gender bias have been documented (see for example the case of fellowship applications to the Swedish Research Council<sup>8</sup>), I have tried to watch for subconscious biases in the assessment of women candidates. I share with each committee the recognition that letters of recommendation for women often emphasize their personal qualities using phrases such as “wonderful mentor to my new graduate students”, “very positive influence in the laboratory”, to a greater extent than do letters for men. The latter give relatively more space to research accomplishments. This may result in an implicit message that the women candidates are not such strong researchers as the men.

Selection committees are searching for the “best” person for each available position. But how do we judge who is “best”? There are objective criteria which are an important part of such a judgment: papers published since completing Ph.D., quality of journals in which the papers are published, number of times which the papers have been cited, creativity shown in research direction, fit of research to that of the members of the hiring Department, teaching experience and ability, mentorship of undergraduate and graduate students and so on. However, there are also subjective impressions of the candidate: will they be a good Departmental citizen, will they be a good role model, how will they represent the University at conferences nationally and internationally? It has been good to hear members of selection committees discuss these points when they meet to make the final selection of the candidate to whom the position will be offered.

## Mentorship of New Faculty

Within the Faculty of Science at the University of Alberta, for each new faculty member, the Department Chair assigns an established faculty member as a mentor. The new faculty and their mentors attend an orientation session before the beginning of term at which I have the opportunity to talk about the expectations of the mentorship. It is then my responsibility to ensure that the process is effective and continuing, and particularly in the case of women in Departments with mostly male faculty, to provide further mentorship if needed. This is one of the important initiatives in the retention of women in male-dominated departments. It helps to create a welcoming and supportive Departmental environment so that women are more likely to stay and have successful careers in the academy<sup>9</sup>.

## Policies

It has been shown in business that when policies are implemented in the workplace which make it attractive to women, they make it more attractive to all employees. Thus, there is a strong case to be made for the introduction of these policies. The Alberta Heritage Foundation for Medical Research has taken the lead in Alberta in automatically increasing the tenure of a grant by one year for each maternity leave taken while holding the grant<sup>10</sup>. The important aspect of this policy is that it is automatic. Some Universities such as Princeton<sup>11</sup> have a similar policy related to tenure: tenure extension of one year is automatic for faculty who have become parents by birth or by adoption, and it is the responsibility of the Department Chair to ensure that this policy is implemented for all faculty.

Increasingly I have come to realize that unless adequate high-quality day care spaces are available on campus, it is difficult to recruit faculty with young children. This is even more crucial to the recruitment of female faculty. Most Universities have recognized this need, but it is often difficult to provide sufficient spaces with the current rate of recruitment of young faculty. Also important to new faculty with young families is flexibility in the time allowed to achieve tenure. Thus, flexibility and transparency in the practices for tenure and promotion are factors which can help to retain recently hired faculty, an important consideration in building a strong, stable and diverse Department and since there is frequently a high financial investment in providing start-up funds.

## Longer Term Strategies

We are aware that many excellent female graduate students are not choosing careers in academe<sup>12</sup>. I have begun to talk with groups of female graduate students to identify some of the reasons why they do not make this choice. The answer I have received most frequently is that they would not be comfortable with the lifestyle of their faculty supervisor. It reflects a question which has been raised by young women scientists for many years: “how do I manage a career and a family?” The perception is that managing a career and a family in academe will be even more difficult than in other employment sectors. This is related to the fact that the tenure clock and the biological clock are ticking at the same time and increases the importance of flexibility

of the tenure clock. However, at least in North America and Europe, it also reflects the work life expectations and stresses in the academy. The Association of Academic Staff at the University of Alberta recently conducted a survey<sup>13</sup> on these issues and together with the Senior Administration have established a Task Force to explore them and make recommendations.

Within the Department of Biological Sciences at the University of Alberta, the graduate students are 50% female, however among the postdoctoral fellows only 10% are women. Since the completion of a postdoctoral fellowship is often a requirement for being hired as a faculty member, this is a transition point in career progress that needs investigation. Focus groups with female graduate student and postdoctoral fellows are planned to tease out some of the reasons why there is such a large drop in representation of women between the two groups. A similar drop in numbers occurs in the transition between postdoctoral studies and becoming a faculty member<sup>14</sup>.

## Conclusion

Why do I believe it is important to have diversity among University faculty in each Department? Women are still socialized differently and may bring a different perspective to a problem, asking different questions. The more perspectives represented in the questions asked, the more robust the ultimate solution to the problem. A more diverse faculty can change the culture of the Department, the Faculty, and the entire University community to make it a more collegial and inspiring place to work, and a place where all people matter. The goal is to work towards having a critical mass of women in each Department in the Faculty of Science, a number which is considered to be at least 30 to 35% of the faculty. Then, the culture should slowly change to be fully inclusive of women, men and minority groups, so that each person can contribute to their full potential.

The University of Alberta is a large (35,000 students) research intensive University, but the initiatives described here could be implemented in many post-secondary institutions with Departments and Faculties which have low representation of diverse groups.

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