

Evaluation of the University Faculty Awards Program

NSERC Management Response

Executive Summary

The University Faculty Awards (UFA) program was created in 1999 with the objective of decreasing the under-representation of women in natural sciences and engineering (NSE) in tenured and tenure-track faculty positions in Canadian universities. In 2001, the program's mandate was expanded to include Aboriginal people in the focus group.

The evaluation of the UFA program was completed in 2006. Results of the evaluation were discussed by the Natural Sciences and Engineering Research Council's (NSERC) Program Evaluation Committee (PEC), the UFA Selection Committee, NSERC's Committee on Grants and Scholarships, and NSERC Council. The following is a summary of the program evaluation recommendations and resulting key action items.

Recommendation 1: Discontinue the UFA program as currently designed

Management Response: Agree

Key action items:

Proposals for new and more efficient programs addressing the recruitment and retention of women and Aboriginal people in NSE are underway.

The long-term focus for developing a successor to the UFA program included separating the two mandates of the program (women and Aboriginal people) and addressing them via different programs (see below for additional information on program development).

In the short term, NSERC adopted program changes to optimize the delivery of the UFA program leading up to the final 2008 competition.

While developing a successor to the UFA program, NSERC will ensure continued delivery of the program to existing award holders after the final 2008 competition.

Recommendation 2: Continue to have a program directed at increasing the representation of women in academia within the natural science and engineering

Management Response: Agree

Key action items:

Policy development commenced with consultations and considerations of other international initiatives, most notably through the Organisation for Economic Co-operation and Development (OECD) Workshop on Women in Science, Engineering and Technology which NSERC co-hosted with Austria in 2006. Analysis is ongoing to determine how a new initiative could most efficiently focus Council resources and address issues such as support for researchers in balancing work and family responsibilities associated with maternity or parental leave. NSERC will examine the possibility of implementing gender-based analysis practices as it moves forward in developing future programs and policies for Canada's research and development sectors.

Recommendation 3: Continue to address the issue of under-representation of Aboriginal people in the academia within the natural sciences and engineering

Management Response: Agree

Key action items:

NSERC developed a new program, the Aboriginal Ambassadors in the Natural Sciences and Engineering (AANSE) supplement program. Launched in 2008, this initiative aims to engage Aboriginal students and fellows in promoting interest and participation in the NSE by visiting Canada's Aboriginal communities and schools and sharing their research and education experiences, or participating in science promotion events and activities.

Recommendation 4: Communicate information about the program

Management Response: Agree

Key action items:

In moving forward with the implementation of recommendations 2 and 3, NSERC will continue implementing effective and comprehensive communications strategies for both programs.

This document constitutes the Natural Sciences and Engineering Research Council (NSERC) management response to the report on the Evaluation of the University Faculty Awards (UFA) program. The evaluation was conducted in 2004-2005. The report, which was initially tabled in 2005 and finalized in 2006, was prepared by the consulting firm of EKOS Research Associates Inc.

Background – Program description

The UFA program was created in 1999 with the objective of decreasing the under-representation of women in natural sciences and engineering (NSE) in tenured and tenure-track faculty positions in Canadian universities. In 2001, the program's mandate was expanded to also include Aboriginal people in the focus group.

The UFA program requires Canadian universities to offer, at the time of nomination, a tenure-track or tenured appointment to nominees. The awards are tenable for a period of five years. NSERC contributes to the partial reimbursement (\$40,000) of the awardee's salary and fringe benefits. Research support is provided through a Discovery Grant. Award holders are expected to devote the majority of their time to research and development, participate in the supervision of students, teach a maximum of one full course per year and accept no more than a half service or administrative load.

In the following text, italics summarize the detailed conclusions of the report on the Evaluation of the University Faculty Awards (UFA) program.

Recommendation 1: Discontinue the UFA Program as currently designed

General Findings:

The UFA program cannot adequately address, simultaneously, the issues and barriers relating to women and Aboriginal people in NSE.

The evaluation report noted that women continue to be under-represented in most disciplines throughout the NSE academic pipeline, and that even though the UFA program had symbolic value for addressing recruitment and retention of women and Aboriginal people in NSE, it does not significantly impact their under-representation.

Management Response:

Indeed, barriers faced by women and Aboriginal people in NSE differ in nature and in stages of academic progression, and NSERC concurs that they should be addressed in separate programs.

General Findings (Women's Component of the UFA Program):

The UFA program addresses the stage of the academic ladder where attrition is least pronounced for women, i.e., from doctoral level to assistant professor.

The evaluation assessed the representation of women at several points along the NSE academic pipeline. The UFA program addresses the stage where women progress from the doctoral or postdoctoral level to the assistant professor level, and the evaluation found that attrition at this stage was least pronounced. Consequently, the focus of the UFA program was deemed to be suboptimal. To further support this assessment, the evaluation compared the progression of two cohorts, the first representing women who were granted their bachelor or first professional degree in 1980 and the second representing women who were granted their bachelor or first professional degree in 1990. The evaluation found that the UFA program yielded no change in the future pattern of attrition within the latter cohort when compared to the former one.

Management Response:

While the UFA program engages women at the point where they progress from the doctoral level to the assistant professor level, it should be noted that its impact is not limited to this area in the academic pipeline. The academic pipeline zone of impact for the UFA program extends the five-year commitment as women progress towards their tenure. This is assured through the eligibility requirements of the program which mandate a tenure-track appointment for every UFA holder.

In fact, while the objective of the UFA program has always been to promote advancement of its participants towards tenure, the report does not actually assess this benchmark. Rather, emphasis is placed on assessing and comparing relative assistant professor populations. The report cites data from 1999 which shows that women represented 23.6 percent of doctoral graduates in the NSE and 24.2 percent of the assistant professors. Although this suggests that this is not a very leaky point in the academic pipeline, the problem lies in the category of assistant professor position which women tend to take up. Recent figures^{1,2} indicate that, regardless of the assistant professor population size, the proportion of female faculty at the assistant professor level who hold tenure-track appointments is much smaller than that of male assistant professor faculty members. It is this factor which then contributes to the relatively low number of tenured full professors in the ensuing decades.

When one considers the attrition of women from the PhD to the full professor level as the zone of impact for the UFA program, it becomes clear that it is indeed the most acute attrition point for the advancement of women in the NSE, and it is precisely the area where the UFA program is directed.

Since the inaugural cohort of UFA nominees (1999) would, on average, not be expected to reach tenure until 2006, its impact on the professoriate would not have been visible in the data analyzed by the program evaluation. Follow-up studies

could be conducted in the future so as to properly ascertain the impact of the UFA program on the representation of women among tenured faculty.

General Findings (Women’s Component of the UFA program):

The UFA program did not significantly impact on the recruitment and retention of women faculty in NSE. Because of the high calibre of UFA recipients, they would likely have been hired without the UFA program.

Management Response:

The UFA evaluation noted that the UFA program has had a positive impact on university hiring practices, and that it has increased awareness and accelerated culture change in some departments. The positive impact that the UFA program has had on the early career progression of award holders is also noteworthy. UFA recipients published more than non-recipients, UFA recipients secured Discovery Grants of larger value compared to non-recipients, and a higher proportion of UFA recipients continued to hold a Discovery Grant over time. These factors are an effect of both the high calibre of UFA recipients and the support they received while in the UFA program. When combined, these factors likely enhance the UFA recipients’ rate of retention and progression along the professorial ranks.

Nominees who were not successful in the UFA competition, but who were successful in the Discovery Grants competition, had similar hiring rates into faculty positions. This would be expected given that both groups were successful in the Discovery Grants competition, and that the common reason for not awarding the UFA was weaknesses in the university’s proposal and not the nominee’s record and potential. Nominees who were not successful in the UFA competition were permitted to keep their Discovery Grant on the condition that they take up an eligible position at a Canadian university. Most universities identified their UFA nominees through regular faculty selection processes, and the high success rate of UFA nominees in the Discovery Grants competition attested to the excellence of the researchers being nominated for the UFA program.

The support offered by the UFA program to women in tenure-track positions has also led to a very low attrition rate over the five years of the program. Within the cohorts which reached the end of the UFA commitment, only 3.2 percent of awardees left academic positions, while the remaining 96.8 percent either completed the UFA program at the nominating institutions or moved to different academic appointments at other institutions.

NSERC concurs that the UFA program’s impact on recruitment is currently less marked than it was during its implementation in 1999. Since its inception, approximately 197 women faculty in NSE have held a UFA, with approximately

25 awards being granted annually. In 1999-2000, approximately 140 first-time applicants for Discovery Grants were women and approximately 1,290 women were employed as NSE faculty in Canadian universities². Thus, approximately 25 percent of these Discovery Grant applicants received a UFA, and the UFA program encompassed roughly 10 percent of women faculty in NSE, an important contribution to recruitment given the relatively modest resources available. As of the 2007 competition, the number of new faculty recruited in Canadian universities had increased significantly and the number of first-time female applicants for Discovery Grants had roughly doubled. On the other hand, the number of UFAs awarded annually had remained at approximately 25; therefore, the expected impact of the program on recruitment is now less marked.

Further discussion of program development as it relates to women appears under Recommendation 2.

General Findings (Aboriginal Component of the UFA program):

The UFA program could not impact on the recruitment of qualified Aboriginal researchers in NSE, because the pool of qualified candidates is extremely small. The program did not target the appropriate stage of academic progression where attrition is greatest for Aboriginal people (i.e., grade school / high school).

Management Response:

NSERC concurs. Aboriginal participation in the UFA program has been low, lending support to the conclusion reached by the program evaluation. Further discussion of program development as it relates to Aboriginal people appears under Recommendation 3.

Management Action Plan Stemming from Recommendation 1:

Although the UFA program yielded significant positive outcomes for the research community, NSERC concurs with the evaluation's recommendation that the program, as currently designed, should be discontinued and will do so following the 2008 competition. The program's overall impact on recruitment of women into NSE faculty positions is no longer significant, and its design was not efficient for impacting on the recruitment of Aboriginal people. NSERC will continue to support existing UFA holders for the duration of their awards.

Proposals for new and more efficient programs addressing the recruitment and retention of women and Aboriginal people in NSE are currently underway. The long-term focus for developing a successor to the UFA program includes separating the two mandates of the program (women and Aboriginal people) and addressing them via different programs. Additional discussion on program development appears under Recommendations 2 and 3.

In implementing this recommendation, and while developing a successor over the long-term, NSERC adopted program changes to optimize the delivery of the UFA program over the short-term. These changes focused on three areas: adjusting the program objective in order to promote faculty retention, harmonizing the duration of the UFA with that of the nominee's Discovery Grant in order to improve program effectiveness, and opening up eligibility requirements in order to facilitate the university hiring process of UFA nominees. While developing a successor to the UFA program, NSERC will ensure continued delivery of the program to existing award holders after the final 2008 competition.

Recommendation 2: Continue to have a program directed at increasing the representation of women in academia within the natural science and engineering

General Findings:

The UFA program should address stages in the academic ladder where attrition is greatest for women, either at the undergraduate and graduate levels, or at the associate and full professor stages. The report also noted a need for increasing interest in sciences among girls at the kindergarten to Grade 12 (K-12) level.

The UFA program did not directly address the barriers impeding progression of women in the NSE, most notably work and family responsibilities, but also different treatment of men and women, the attitude of colleagues, the lack of female role models, the need for geographic mobility and the difference in networking styles between men and women. Although the UFA program targets under-represented individuals, ultimately it may not affect core elements such as institutional, societal and cultural factors that interact to create and perpetuate barriers and inequities.

There exists a continued need for programs addressing the under-representation of women in the NSE, and NSERC must remain a key catalyst for stimulating change.

Management Response:

NSERC involvement at the K-12 level is mainly through the PromoScience program. PromoScience has funded organizations working with young Canadians to promote interest in, and understanding of, science and engineering. In 2007, 15 PromoScience projects focused specifically on providing hands-on science experiences for girls. The Centres for Research in Youth, Science Teaching and Learning (CRYSTAL) pilot program, implemented from 2005 to 2010, has also provided a forum for the many partners who share an interest in developing and

enhancing the skills of, and resources available to, science and mathematics teachers.

An important key to decreasing the attrition of female students in the NSE is the implementation of mentorship, education and accessibility programs early on in the education cycle. This finding from the program evaluation is further supported by the presence of similar programs abroad, notably, various programs through the Japanese Ministry of Education, Culture, Sports, Science and Technology,³ and the Science for Youngsters program at the National Centre of Competence in Research Quantum Photonics in Switzerland.⁴

The evaluation report proposed two alternative approaches to decreasing the under-representation of women in the NSE. Firstly, it suggested an examination of methods for decreasing the attrition of female students so as to increase the pool of potential professorial candidates. Alternately, it proposed the implementation of a program aimed at providing young female academics with assistance as they progress through the academic pipeline, most notably after maternity or parental leave.

There is consensus that additional scholarships targeted for women at the undergraduate and graduate levels would not be warranted. NSERC's commitment to USRA and PGS/CGS and PDF programs is significant, and the participation and success rates of female applicants in these programs is high. As the UFA evaluation report focused on faculty, it contains little information concerning attrition factors at the graduate levels. However, abundant anecdotal evidence suggests that family issues are an important reason for women leaving academia. It is noteworthy that NSERC currently has a maternity/parental leave policy for scholarships recipients. In addition, Discovery Grant holders may also apply for a supplemental maternity/parental leave stipend to support students being paid out of their Discovery Grant.

NSERC concurs with the evaluation's finding, and other studies,^{5,6} showing that among the reasons identified for women's slower and more difficult progression in academic careers family responsibilities is by far the most important. In agreement with the evaluation report's findings, NSERC concurs that any future successors to the UFA program should support researchers in balancing their work and family responsibilities. Several other member countries of the Organisation for Economic Co-operation and Development (OECD) have also independently identified this factor as a key to reducing the under-representation of women in NSE. Japan, for example, has implemented policy in the form of postdoctoral support and grants for researchers taking parental leave.³ Norway, on the other hand, has employed incentives such as start-up packages and grants towards obtaining professorial qualifications.⁷ In fact, the OECD has directly linked programs which support

female researchers in balancing their work and family responsibilities with a resulting increase in the economic prosperity of nations⁸ and has identified several best practices to this end.⁹ These include the importance of family-friendly working practices to promote employee commitment, as well as government regulation to create affordable and effective child care provisions.

Management Action Plan Stemming from Recommendation 2:

NSERC concurs with the evaluation's recommendation that NSERC should continue to have a program or initiative directed at decreasing the under-representation of women in academia within the NSE. Policy development commenced with consultations and considerations of other international initiatives, most notably through the OECD Workshop on Women in Science, Engineering and Technology which NSERC co-hosted with Austria in 2006. Analysis is ongoing to determine how a new initiative could most efficiently focus Council resources and address issues such as support for researchers in balancing work and family responsibilities associated with maternity or parental leave. It should be noted that this focus aligns with the conclusion of the program evaluation and is further supported by concurring evidence from the United States^{10,11} which shows that the presence of pre-kindergarten age children can lower a woman's likelihood of having a tenure-track position by approximately 8.1 percent.

In addition, NSERC will examine the possibility of implementing gender-based analysis practices^{7,12} as it moves forward in developing future programs and policies for Canada's research and development sectors. It will also seek to participate in the international discourse related to this key topic through participation in such fora as the OECD Helsinki group.¹³

Recommendation 3: Continue to address the issue of under-representation of Aboriginal people in academia within the natural sciences and engineering

General Findings:

The UFA program cannot impact on the recruitment of qualified Aboriginal researchers in academia because the pool of qualified candidates is extremely small. In assessing the relevance of the UFA program to Aboriginal people, the report focused on expert testimony to ascertain the key barriers to eliminating the under-representation of this group in the NSE. Expert testimony identified a need to engage Aboriginal students at the elementary and high school levels and provide them with strong role models as keys to achieving maximal impact. The study also concluded that barriers facing Aboriginal persons manifested themselves much earlier than those affecting women.

Management Response:

NSERC concurs with the evaluation report in that there exists a considerable need to decrease the under-representation of Aboriginal persons in NSE and that there is a corresponding need for NSERC to develop a program focused specifically on the recruitment and retention of Aboriginal persons in NSE. The report recommended, however, that such a program be directed at increasing the level of interest in NSE among Aboriginal youth, where attrition from the academic pipeline is more significant.

It is noteworthy that NSERC currently has programs and policies to encourage recruitment and retention of Aboriginal people in NSE:

- K-12 level: Of the five CRYSTAL centres, two include a specific focus on Aboriginal K-12 education issues in math and science, and one centre also includes a focus on Aboriginal students. Every year, a number of PromoScience grants are awarded to organizations targeting Aboriginal youth;
- Undergraduate level: Universities may offer Undergraduate Student Research Award (USRA) scholarships to meritorious Aboriginal candidates outside of their usual quota of awards;
- Graduate and postdoctoral levels: Aboriginal candidates in the Postgraduate Scholarships (PGS), Canada Graduate Scholarships (CGS) and Postdoctoral Fellowships (PDF) competitions, who are ranked as meritorious and below the funding cut-off, receive an award.

The evaluation report suggested that barriers which affect the advancement of Aboriginal persons in the NSE appear earlier, and differ from, those affecting women. A national consultation effort of more than 20 stakeholder institutions throughout Canada was conducted by NSERC¹⁴ in 2005. Its conclusions supported those of the evaluation report and further highlighted the unique pressures facing the Aboriginal community.

Management Action Plan Stemming from Recommendation 3:

NSERC concurs with the evaluation's recommendation that NSERC should continue to have a program directed at decreasing the under-representation of Aboriginal persons in academia within the NSE.

As such, NSERC developed a new program initiative, the Aboriginal Ambassadors in the Natural Sciences and Engineering (AANSE) supplement program focused exclusively at addressing the advancement of Aboriginal persons through the NSE pipeline. Launched in 2008, this initiative aims to engage Aboriginal students and fellows in promoting interest and participation in the NSE

by visiting Canada's Aboriginal communities and schools and sharing their research and education experiences, or participating in science promotion events and activities. In developing this approach, NSERC leverages the existing knowledge and infrastructure available through PromoScience-funded organizations, science centres and other partners, and actively seeks to establish synergies with external NSE organizations already engaged in Aboriginal communities.

Recommendation 4: Communicate information about the program

General Findings:

The evaluation report recommended that NSERC develop a thorough communication strategy for the new programs and continually highlight achievements of program participants to the broader research community. In making the recommendation, the evaluation report pointed to the relative lack of community awareness of the UFA program, while highlighting other best practice models.

Management Response:

NSERC concurs that the communications strategy for the UFA program has historically focused on the dissemination of competition information and administrative notification of decisions, with less emphasis on highlighting UFA award holders and the prestige of the program.

Management Action Plan Stemming from Recommendation 4:

NSERC concurs with the evaluation's recommendation that NSERC should communicate information about the program. In moving forward with the implementation of recommendations 2 and 3, NSERC will develop effective and comprehensive communications strategies for both programs. These strategies will aim to engage the research community during the initial implementation phase as well as the program life cycle phase, and aim to highlight the achievements of program participants to the broader research community.

References:

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