

## **Promoting Institutional Change via the Faculty Search Process: Career Workshops and a National Database**

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### **Abstract**

The under-representation of women and U.S. ethnic minorities in science, technology, mathematics, and engineering (STEM) is a well established fact. There are numerous studies that disclose reasons for this under-representation at all steps along the academic process. In response to this research and in the interest of bridging the Ph.D. and postdoctoral scholar steps into an academic career, the Cockrell School of Engineering at the University of Texas at Austin, the George R. Brown School of Engineering at Rice University, and the Wiess School of Natural Sciences at Rice University in Houston, Texas have designed and hosted workshops since October 2004 entitled, *Negotiating the Ideal Faculty Position*. The workshops at Rice University are funded through a National Science Foundation (NSF) ADVANCE institutional transformation grant. At each of these workshops, a national invitation was extended and 350-730 women responded with applications. This level of response clearly demonstrates the interest in the topic and, at the same time, the lack of information available to women in their local institutions. One to three follow-up surveys have been completed by the workshop participants. The longitudinal data show that these workshops have had a strong impact on the participants' career paths, with a high percentage pursuing (and succeeding in) academic careers.

### **Introduction**

In the Fall of 2004, the Cockrell School of Engineering at the University of Texas at Austin (UT Austin) developed a three-day, interactive workshop called, *Negotiating the Ideal Faculty Position* (NIFP), for female Ph.D. students (within two years of degree completion) and postdoctoral scholars interested in academic careers in engineering. This workshop was first offered at UT Austin in October 2004 and again offered in 2006 and 2007 at Rice University, where it was broadened to include both engineers and scientists. Participants from across the U.S. were invited to submit applications to attend. Travel funds were provided for those selected by faculty review committees. The primary workshop goal was to inform participants about the key factors in finding and successfully negotiating for the faculty position that best matched their long-term career goals. Other goals included identifying a pool of excellent female graduate students and postdoctoral scholars interested in future faculty positions and developing a positive relationship between these candidates and faculty within a potential hiring department.

### **Why Are *Negotiating the Ideal Faculty Position* Workshops Needed?**

Given the close working relationship between graduate students and their faculty advisors, it is often assumed that female graduate students receive the encouragement, guidance and mentoring needed to pursue academic careers. Yet, the high number of applicants for the NIFP workshops

and other data suggest otherwise; that is, that female graduate students are not being adequately encouraged, guided and mentored to pursue academic careers.

The first NIFP workshop held at UT Austin was advertised by mailing a flyer to engineering deans in the U.S. and by sending a notice through listserves that target the female engineering communities. At UT Austin, workshop planners were very surprised (and pleased) by the response. Over 350 applications were received from engineering graduate students for the 40 available spaces; the number of applicants was greater than 1/3 of the entire national pool of female engineering Ph.D. recipients in the U.S. in 2003. (NSF 2003) Similar advertisement strategies were used at Rice University and were broadened to include the science academic community and outreach to the ethnic minority academic community. Again, the response rate was exceptional. Over 710 applications were received in 2006 and 735 applications were received in 2007 from engineers and scientists. Given that publicity costs were minimal (less than \$60 was spent on the UT Austin workshop for advertising), this response demonstrates a significant interest in and a lack of information about obtaining academic positions.

This lack of information was further demonstrated by applicants to the 2004 UT Austin NIFP workshop. They voiced concerns about the lack of guidance and resources available to them in comments made in their personal statements on the UT workshop application:

“The world of academia is complex, and much of the knowledge needed to navigate it is not readily available to would be participants without some trial and error.” *Ph.D. candidate within two years of completing degree*

“I would like to become a professor, but do not feel that I am very knowledgeable in what kinds of things I should know in order to accomplish this.” *Ph.D. candidate within one year of completing degree*

“I have recently been struggling to figure out what to look for in an institution, while at the same time wondering how I’m supposed to know things such as what I’ll need in start up costs to build a lab once I find a place and position that I like.” *Ph.D. candidate within two years of completing degree*

“I could hardly believe what I read on the workshop announcement for “Negotiating the Ideal Faculty Position.” There, in the center of the announcement, were the very same questions and issues that I had been wondering about for the past few years!” *Ph.D. candidate within one year of completing degree*

“I am now certain that I want a faculty position with my own lab, but have many questions about the process of finding and securing such a position and starting my own lab. Although I have a good mentor and supporting department, finding time to discuss career-related questions is often difficult with all the technical issues that arise.” *Ph.D. candidate within two years of completing degree*

The responses from a Spring 2007 graduate survey at UT Austin (unpublished results) further demonstrates the lack of mentoring female graduate students receive about academic careers.

Over 390 female engineering graduate students were surveyed to determine their career aspirations; a total of 121 students (31%) completed the survey. The survey included questions that addressed several topics, including career areas of interest, confidence levels in pursuing academic positions, encouragement received from faculty to pursue faculty positions, and perceptions of faculty satisfaction with their career choice.

Twenty-six percent (n = 31) of the respondents indicated they are pursuing a Master's degree only. Seventy-four percent (n = 90) indicated they are pursuing or may be planning to pursue a Ph.D. degree. For the purposes of this paper, responses from the latter group will be highlighted since they are more likely to consider academic careers than the Master's only group. (In fact, only 2 of the 31 Master's degree only students indicated they are considering academic careers.) Table 1 shows the responses to select survey questions.

Although a good majority (66 percent) indicated they were planning to explore academic careers, 69 percent responded that they had received some or no encouragement from their faculty to pursue such positions. This may explain why 64 percent indicated they were only somewhat confident or not confident at all that a faculty position was a good match for their career interests.

The lack of mentoring is not only at the Ph.D. level, but continues into postdoctoral studies. In the Sigma Xi Postdoc survey (Davis 2005), 43 percent of respondents reported not recognizing their postdoctoral position as a professional training experience. Twenty-four percent reported they do not consider their advisor to be a mentor. The majority reported receiving no formal training outside the laboratory. An earlier postdoctoral

study by the American Association of Universities (AAU) (Sample 1998), reported that while 60 percent of the postdoctoral scholars go into employment at research universities, only about one quarter of these go into tenure-track faculty positions. Over the past decade, postdoctoral scholars have increased (2.3% per year), while full time tenure-track faculty positions have not increased comparatively (.08% per year). As time goes by, even fewer postdoctoral scholars will gain employment in research universities even though almost two-thirds report they are planning a career in a research university.

In the Sigma Xi survey (Davis 2005), postdoctoral scholars identified stipends, benefits, career advising, and job placement assistance as the areas needing the most improvement. In the AAU

<b>Table 1: Responses from Spring 2007 Survey of UT Austin Female Graduate Students Who Are Pursuing or Who May Be Pursuing Ph.D.</b>	
<b>“As of today, which of the following do you plan to explore for employment after completing your final degree?” (n = 90)</b>	
66%:	Academia
58%:	Industry
51%:	Private or Governmental Research Lab
30%:	Consulting
4%:	Other
<b>“How confident are you today that a faculty position is a good match for your career interests?” (n = 64)</b>	
11%:	Extremely confident
25%:	Very Confident
47%:	Somewhat Confident
17%:	Not Confident at All
<b>“How much encouragement are you receiving from your faculty advisor and/or other faculty to consider a career in academia?” (n = 84)</b>	
31%:	Significant Encouragement
42%:	Some Encouragement
27%:	No Encouragement

report (Sample 1998), one of eight recommendations they gave to institutions employing postdoctoral scholars was to provide career advising and job assistance training. In addition to these recommendations from national studies, the White House approved a new provision on postdoctoral mentoring as part of a larger bill, The America COMPETES Act, passed by the U.S. Congress. (America 2006) In Section 7008, it states:

- (a) “Mentoring – The Director shall require that all grant applications that include funding to support postdoctoral researchers include a description of the mentoring activities that will be provided for such individuals, and shall ensure that this part of the application is evaluated under the Foundation’s broader impacts merit review criterion. Mentoring activities may include career counseling, training in preparing grant applications, guidance on ways to improve teaching skills, and training in research ethics.”

All Ph.D. and postdoctoral scholars face significant challenges in securing a faculty position, but for women these issues are often compounded by spouses/partners and/or children. Females holding doctorates in science and engineering are almost twice as likely as males to have spouses employed full time: 82 percent of the married females and 42 percent of the married males had spouses employed full time in 2001. (NSF 2004) Female Ph.D.s, if married with children under 6 years of age, are 50 percent less likely to enter a tenure-track position than married men with children under 6 years of age. (Mason 2003) All these data clearly demonstrate the need for encouraging and supporting women who are considering academic careers.

### ***Negotiating the Ideal Faculty Position Workshop Logistics***

As stated previously, the primary goal of the NIFP workshops was to inform participants about the key factors in finding and successfully negotiating for the faculty position that best matched their long-term career goals; secondary goals were to identify a pool of excellent female graduate students and post-docs interested in future faculty positions and to develop a positive relationship between these candidates and faculty within a potential hiring department.

Attendees in each area were selected by a committee composed of male and female faculty members from the relevant department. Many departments circulated applications in their area to broad groups of their faculty to select candidates, ensuring that potential search committee members had resume access to a significant pool of potential future female faculty candidates. This strategy has proven successful in engaging faculty with the participants. When faculty reviewed the applicants, they were very pleased with the outstanding research being done by the applicants and the postdoctoral positions held. Many of the departments selected NIFP applicants they were interested in meeting. Some stayed for a departmental seminar or were invited to return for a technical seminar. This has been an effective avenue for search committees to become more inclusive of female candidates.

At both UT Austin and Rice University, the workshop content (Table 2) was designed with major input from faculty across the relevant disciplines, including department chairs and search committee members. The three workshop sessions participants ranked the highest in both 2006

and 2007 included: “How to negotiate a good start up package,” “Understanding the tenure process,” and “How to stand out in the interview.” Workshop activities were designed to be highly interactive. For example, attendees presented the first 10 minutes of their interview seminars to an audience of faculty members

**Table 2: Topics Covered in Negotiating the Ideal Faculty Position Workshop**

- Finding the right institutional fit for you
- What is a search committee looking for?
- Putting together a successful faculty application
- How to stand out in the interview
- How to maximize the impact of your interview seminar
- How and when to negotiate a good start up package
- How to safely find out about the culture of the department & college
- Choosing good collaborators
- How to obtain funding
- Building your lab
- Time management
- Understanding the tenure process
- Balancing work and family

Presentation materials can be found at: <http://cnx.org/content/col10442/latest/>

and attendees; participants were then provided critical feedback about how to improve the presentation. There were six to eight presentations in a two-hour time block. The participants received feedback from the other participants and from departmental faculty. (Each room had two to four faculty members present.) Candidates were also given an opportunity to practice answering potentially difficult questions that might be posed during an interview or seminar.

As part of one session, participants were asked to anonymously submit their biggest concern regarding their job search, and panels of faculty members were organized to discuss and respond with potential solutions. Their concerns included:

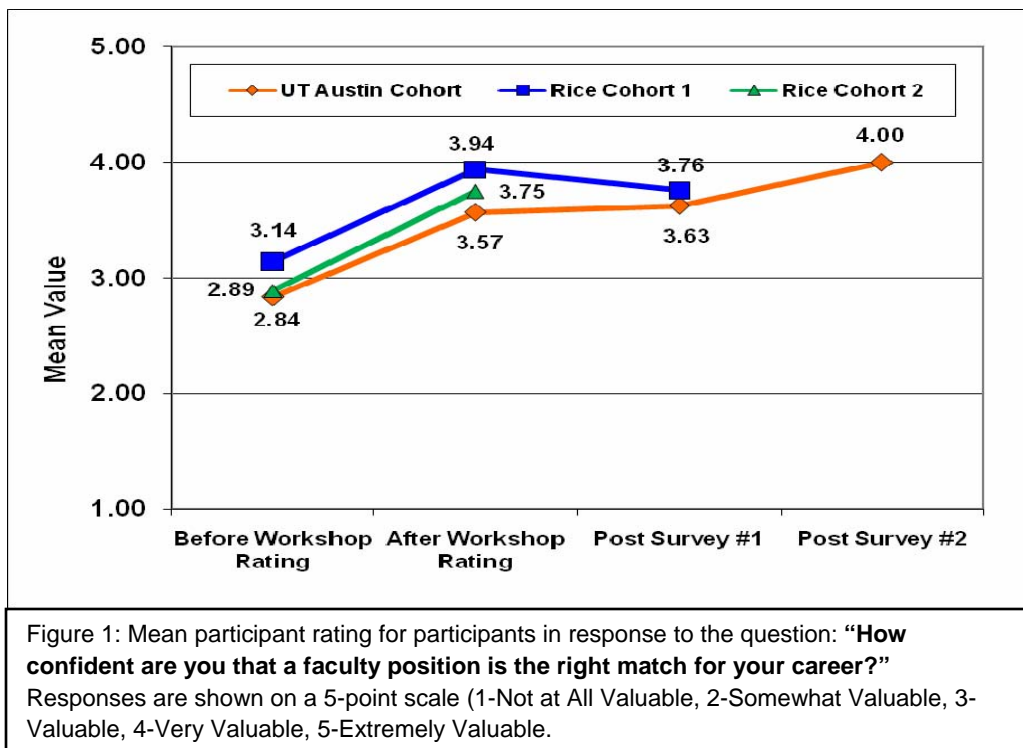
- Lack of Self-Confidence
  - Not getting any offers
  - Getting an offer and finding that you are incapable of doing the job
  - Appearing too eager or too aggressive in an interview
  - How to project confidence when nervous
  - Fears regarding inability to obtain funding
  - Concern about ability to get tenure
- Work-Life Balance
  - Fear that job will consume life
  - Coordinating searches for two career couples
- Workplace Environment
  - Fear that environment will be unsupportive of women
  - Concern about cultural differences (for international students)
- Information Regarding Job Search and Job Skills
  - Concerns about presenting seminar and answering difficult questions
  - Concern regarding accurately estimating start up needs
  - Concerns regarding teaching the first class
  - Fear of not being an effective mentor
  - How to decide between multiple offers

These concerns are consistent with other research findings for female candidates; for example, graduate students in the life sciences cited concerns related to finding a job, balancing personal and professional responsibilities and academic and professional development as the most pressing concerns regarding pursuing an academic career. (Moyer 1999) Many institutions,

including top ranked Research 1 schools, find that women consistently turn down academic job offers at a far higher rate than male candidates. (Boyce 2002) Faculty who participated in the NIFP workshops were directly exposed to the concerns voiced by the outstanding participants about considering an academic career. By understanding the concerns of under-represented graduate students and postdoctoral scholars, department chairs and faculty can develop the elements of a job offer that will enhance successful recruiting.

## Workshop Success Indicators

To assess the potential benefits of attendance, participants were surveyed prior to (100%



response rate), immediately following (86 to 97% response rate), at one year (67 to 70% response rate), and at two years (70% response rate) following the workshop. (Figure 1) To protect participant anonymity, participants were not asked to identify their ethnicity or engineering/science discipline on any of the workshop surveys. Immediately following the workshop, participants rated the overall value of the 2004 UT Austin workshop as 4.72 on a 5-point scale (5 = Extremely Valuable); in 2006, a similar rating of 4.62 was reported by the Rice participants; and in 2007, Rice participants rated the workshop value as 4.25. On post workshop surveys, 59 percent of the 2004 UT Austin participants indicated greater confidence that a faculty position was a good match for their career interests. Similarly, 53 percent of the 2006 Rice participants and 56 percent of the 2007 Rice participants indicated greater confidence that a faculty position was a good match for their career interests. Sixty-eight percent of the 2004 UT Austin participants indicated greater interest in pursuing a faculty position at a Research 1 institution as a result of the workshop. Eighty-two percent of the 2006 Rice participants indicated greater interest in pursuing a faculty position at a Research 1 institution as a result of

the workshop. Many attendees have concluded their first job searches and have written to describe the impact the workshop made on their search (Table 3).

The workshop provided candidates with formal access to information and valuable skill building opportunities, which are usually only transmitted through informal mentoring relationships. Bringing together a large group of female attendees also helped to develop a network of peers, many of whom share similar concerns. The large number of female faculty presenters offered an introduction to women who had negotiated these issues in their own careers. The participation of male faculty expanded the mentoring network and demonstrated broad-based support for diversifying the academic ranks. Several other institutions have recently hosted workshops with similar goals, including the University of Maryland at Baltimore County, Virginia Tech, and George Washington University.

**Table 3: Participant Comments**

"I looked through the workshop materials numerous times during the search process, and took the folder with me to the first few interviews. The information on evaluating the 'goodness of fit' was the most valuable to me personally. That information enabled me to determine what I needed to be successful and happy. It also helped me notice potential issues at each university and evaluate whether or not the issues were things I could overcome or accept. Most importantly, it helped me make my decision based on what university was best for me, not what was the best ranked, or what my top choices were at the beginning of the process. I hope that your workshop will continue and that other universities will start holding similar workshops." *2004 workshop participant*

"I still feel that the most important thing I gained from the workshop was confidence. It was inspirational to meet so many successful scientists who had families, were very happy with the decision they had made to stick with academia. It was also great to meet other fabulous women in my situation." *2006 workshop participant*

The NIFP workshop developers did not anticipate the extent to which planning and executing the workshop would initiate new conversation and actions among a diverse group of faculty. These interactions focused on improving the mentoring of students interested in academic careers, diversifying the candidate pool, and developing strategies to help candidates succeed. Over 60 faculty from UT Austin (approximately 25% of the total engineering faculty) and 78 faculty from Rice (36% of the total faculty in science and engineering) participated in the inaugural workshop at each institution. Many of them, including those who serve on search committees, were able to meet a large number of outstanding female students and postdoctoral fellows interested in pursuing an academic career. Following the 2006 workshop, Rice department chairs were surveyed to determine if workshop participants were being considered for faculty positions. Five out of 14 department chairs responded; one participant was interviewed; one was invited for a seminar; and six were being targeted for future consideration.

**National Database of Women in STEM fields**

In addition to the workshop, the Rice ADVANCE Program established a database of CV's from applicants who wished to share their materials with institutions searching for science and engineering faculty. To date, 1,368 out of 1,447 (95%) applicants and participants have chosen to include their materials in the database. The database was advertised by mailing a postcard to over 600 institutional contacts and putting the information on multiple list-serves. The ADVANCE office and bioengineering staff worked with Rice web services to develop an

interactive website for the database. The site is searchable by field, name, research area, and school. The search results are down-loadable into an excel spreadsheet.

The Rice ADVANCE Program received multiple requests from faculty about opening the database to additional women. A “contributor” designation was created in response to this request. The database continues to be open to those who want to apply for the NIFP workshop and to those who just want to contribute their CV information. To date, there have been over 700 visitors representing 98 different universities. Sixty-two percent report they are part of a faculty search committee. The database can be found at <http://www.advance.rice.edu/database/>.

## Conclusions

The decisions to invite external participants, their geographic location(s), the number of participants, are all questions each institution should consider when designing a NIFP workshop, especially if funding is an issue; however, funding availability does not have to be a barrier. Institutions can institute cost effective programs similar to the intensive three-day NIFP workshops offered at UT Austin and Rice in several different modes:

- a graduate seminar that meets on a regular basis for credit
- a monthly/weekly informal seminar series
- half day to one day seminars

Regardless of the format, initiatives like *Negotiating the Ideal Faculty Position* provide numerous benefits to both participants and faculty. For female Ph.D. and postdoctoral scholars, the information conveyed encourages them to pursue academic careers, and their participation in the workshop boosts their confidence to do so. For faculty, reviewing workshop applications, making presentations or giving formal or informal feedback provides meaningful opportunities to mentor a willing audience. In addition, their workshop participation introduces them to highly qualified female candidates early in the faculty search process. The national database provides an additional link to the pipeline of prospective female faculty. By using it, search committees move from a passive to proactive approach of recruiting female candidates. Both the workshops and the database debunk the excuse often heard from search committees, “We tried but we just could not find any women.” The three NIFP workshops delivered to date, along with the national database, prove that female Ph.D. and postdoctoral scholars are interested in academic careers and that they can be “found.” More efforts like these are needed to ensure an inclusive model for faculty searches that ultimately will help institutions recruit the best possible scholars for academic careers.

NOTE: The Rice NIFP presentation materials can be found on the web at: <http://www.advance.rice.edu/negotiatingtheidealfacultyposition/resources.html> Materials can also be found at *Connexions*, an online repository and set of software tools for collaboratively developing, freely sharing, and quickly publishing educational content. The Content Commons contains educational modules that can be grouped together into larger courses. There are currently over 4,000 educational modules in Connexions. This concept is on the cutting-edge of how technology and teaching information are being shared. The NIFP workshop materials can be found at <http://cnx.org/content/col10442/latest/>

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