AdvanceVT **Annual Report**
Year 5: September 2007 – August 2008
National Science Foundation
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Contents

Program Overview

The overall goal of *AdvanceVT* is to contribute to the development of a national science and engineering academic workforce that includes the full participation of women at all levels of faculty and academic leadership, particularly at the senior academic ranks, through the transformation of institutional practices, policies, climate and culture at Virginia Tech. The program has four major elements: advancing women into faculty careers, increasing the representation of women faculty in science and engineering, empowering women as leaders and scholars, and institutionalizing change.

Significant accomplishments during year five include the submission of a collaborative proposal for a PAID grant to disseminate *AdvanceVT*'s leadership coaching model throughout Virginia with the ACE Virginia Network, James Madison University, University of Virginia, Virginia Commonwealth University, and the Virginia Community College System. Also, after a two year effort, *AdvanceVT* unveiled *Creating a Positive Departmental Climate at Virginia Tech: A Compendium of Successful Strategies*. The compendium draws from results of an initial 2006 Departmental Climate Initiative survey, *AdvanceVT* workshop discussions on existing strategies, *AdvanceVT* 2003 faculty work-life survey data, a literature review, and materials from other institutions. In addition to maintaining a portfolio of workshops and seminars, *AdvanceVT* co-hosted the fifth annual "Advancing Diversity at Virginia Tech" conference on January 8, with the Office of Multicultural Affairs. *AdvanceVT* also began development of a database of potential faculty candidates, with a focus on candidates with diverse backgrounds, in collaboration with the Office for Equal Opportunity.

Indicators of institutional change:

- The number and percentage of women tenured and tenure-track faculty in the College of Engineering has increased from 21 (7.3%) in fall 2001 to 41 (13%) in fall 2007.
- The number and percentage of women tenured and tenure-track faculty in the College of Natural Resources has increased from 6 (10%) in fall 2001 to 14 (23%) in fall 2007.
- At the end of 2007, the Dual-Career Assistance Office reported 67 new cases of faculty seeking assistance through the office. Thirty-nine participants were new hires, 19 were retention cases (up from 7 the previous year) and 9 subsequently declined offers (down 1 from the previous year).
- Dr. Barbara Ryder from Rutgers University accepted the position of Department Head in Computer Science, and will be the first female department head in the College of Engineering at Virginia Tech when she joins the university in August 2008.
- *AdvanceVT,* the Women's Center, and the Women's Studies Program of Virginia Tech presented a day of activities celebrating the 35th anniversary of Title IX of the Education Amendments of 1972 to the Civil Rights Act of 1964.

Participants

Project Management System and Infrastructure
During year five of the program, *AdvanceVT* continued to operate under a leadership structure developed at the end of year three, with a subset of the Leadership Team also serving on the Executive Committee. Provost and Senior Vice-President Mark McNamee continued as Principal Investigator (PI) for the Advance program at Virginia Tech, and Associate Provost Patricia Hyer continued as Co-PI. Professor Beate Schmittmann and Associate Professor Tonya Smith-Jackson also continued as Co-PIs and members of the Executive Committee. Elizabeth Creamer, professor of Educational Leadership and Policy Studies, continued in her role as Assessment Director. Project Director Peggy Layne and Administrative Assistant Robyn Midkiff continued in their respective roles. Graduate assistants Ane Johnson, Tonya Saddler, and Tamara Savelyeva supported the program in year five. Associate Professors Roseanne Foti, Janis Terpenny, and Eileen Van Aken, and Associate Dean Nancy Ross served as Advance Professors and members of the leadership team. Dr. Foti led the leadership development program, Dr. Ross continued as College Liaison to the College of Science, and Dr. Van Aken joined as the new liaison to the College of Engineering. Associate Dean Jack Finney continued in his role on the Leadership Team and as leader of the Departmental Climate Initiative.

Overall responsibility for allocation of project funds resides with the Principal Investigator, Provost Mark McNamee, with day-to-day oversight delegated to Project Director Peggy Layne. All financial matters are conducted with the oversight of the university's Office of Sponsored Programs, in accordance with all appropriate policies and procedures. Administrative Assistant Robyn Midkiff processes financial paperwork and maintains all program files. Provost office bookkeeper Alva Phillips prepares monthly financial reports for review by Project Director Layne.

Executive Committee
During year five, the Executive Committee met twice each semester to provide programmatic oversight and high level support for the program, with increased attention to institutionalization and sustainability of *AdvanceVT* initiatives. The following individuals served on the Executive Committee:

Richard Benson, Dean, College of Engineering
Lay Nam Chang, Dean, College of Science
Karen DePauw, Vice President and Dean, Graduate Education
Peggy Layne, Project Director, *AdvanceVT*
Mark McNamee, Provost and Senior Vice President
Patricia Hyer, Associate Provost for Academic Administration
Beate Schmittmann, Professor and Department Head, Physics
Tonya Smith-Jackson, Associate Professor, Industrial & Systems Engineering

Leadership Team
During year five, the leadership team met monthly to review progress and plan activities. Program priorities for the year focused on increasing visibility both on campus and in the

broader community, and moving towards institutionalization of *AdvanceVT* programs. The following individuals served on the Leadership Team:

Elizabeth Creamer, Assessment Director
Jack Finney, Department Climate Initiative
Roseanne Foti, Advance Professor
Patricia Hyer, Co-PI
Peggy Layne, Project Director
Mark McNamee, Principal Investigator
Nancy Ross, Advance Professor, College of Science Liaison
Janis Terpenny, Advance Professor
Eileen Van Aken, Advance Professor, College of Engineering Liaison

<u>Work Groups and Committees</u>
During year five, *AdvanceVT* continued efforts directed towards revising and implementing university policies, preparing young women scholars for faculty careers, improving faculty recruitment, preparing women faculty for leadership roles, and warming department climate at the university. These efforts were overseen by committees and work groups of faculty and administrators. Fewer committees met in year five as the program moves towards institutionalization. Committees in charge of selecting fellowship and seed grant recipients did not convene in year five as fellowships and seed grants will not be awarded in the 2008-2009 academic year. The policy committee did not meet in year five because emphasis has shifted from developing and revising policies to educating faculty and administrators about policies and monitoring their implementation.

Institutionalizing Change

<u>Department Climate Committee</u>

Chair: Jack Finney, Associate Dean, College of Science
- Carla Finkielstein, Assistant Professor, Biological Sciences
- Joe Merola, Professor and Department Head, Chemistry
- Ishwar Puri, Professor and Department Head, Engineering Science and Mechanics
- Don Taylor, Professor and Department Head, Industrial and Systems Engineering

Increasing Representation of Women Faculty in Science and Engineering

<u>*AdvanceVT* Visiting Scholars Committee</u>

- Mary Marchant, Associate Dean and Director of Academic Programs, College of Agriculture and Life Sciences
- Layne Watson, Professor, Computer Science
- Julie Dunsmore, Assistant Professor, Psychology
- Janis Terpenny, Associate Professor, Engineering Education

Advancing Women into Faculty Careers

Graduate Student and Post-doc Seminars Committee

- Elisa Sotelino, Professor, Civil and Environmental Engineering
- Felicia Etzkorn, Associate Professor, Chemistry
- Jill Sible, Associate Professor, Biological Sciences
- Maura Borrego, Assistant Professor, Engineering Education

Activities and Findings

Research and Evaluation Activities and Findings

In year five, *AdvanceVT* undertook a variety of assessment activities in order to gauge the impact of the grant on the university, in line with the recommendations of external evaluators. *AdvanceVT* continued to conduct annual evaluations of the Leadership Development Program, the Ph.D. & Postdoctoral Fellowship program, and the Research Seed Grant program. Additional activities included work-life policies impact assessment, a pre-tenure faculty workshop, and the completion of the longitudinal study of the 2003 cohort of new faculty hires in the colleges of science and engineering.

Ellen Plummer, Director of the Women's Center, received her Ph.D. in Educational Leadership and Policy Studies at Virginia Tech in December 2006. Her dissertation, entitled *Institutional Transformation: An Analysis of Change Initiatives at NSF ADVANCE Institutions*, examined how institutional culture promoted or impeded the implementation of round one and two NSF ADVANCE initiatives designed to improve academic climates for women in science and engineering. Dr. Plummer discovered:
- Policies, processes, and programs were implemented by participants at the institutional, departmental, and individual levels and included family friendly and dual career policies at the institutional level, improved departmental faculty search and climate improvement processes, and mentoring programs and training for department heads at the individual level.
- Communication and leadership strategies were keys to the successful implementation of policies, processes, and programs designed to achieve institutional transformation. Communication strategies involved shaping change messages to reach varied audiences, often with the argument that change efforts would improve the climate for everyone, not just women faculty members. Administrative and faculty leaders from multiple levels proved important to change efforts.

COACHE Survey

During spring of 2007, Virginia Tech participated in the Collaborative on Academic Careers in Higher Education (COACHE) study. The COACHE survey was distributed to 211 pre-tenure faculty at Virginia Tech hired before January of 2006. Seventy-nine percent of these faculty members responded to the survey. Conducted by the Harvard Graduate School of Education, the survey measures the institutional experiences and job

satisfaction of full-time, pre-tenure faculty. Virginia Tech received its results from the collaborative in summer 2007.

The results provide descriptive statistics and significant differences within institution by gender, race, discipline, and college. The results were first compared to five selected peer institutions (Iowa State University, Michigan State University, North Carolina State University, Ohio State University, and University of Illinois at Urbana-Champaign) and were then compared to the mean scores for overall, gender, race and discipline statistics of all 54 university participants in COACHE survey. Survey questions focus on five major themes: tenure; nature of work; polices and practices; climate, culture, and collegiality; and global satisfaction. Results from the survey were used to educate department heads and promotion and tenure committees on how pre-tenure faculty experience life in their departments and the tenure process.

Pre-Tenure Faculty Workshop

To identify ways to address issues identified by the COACHE survey, pre-tenure faculty were invited to a half-day workshop. Participants (about 45 pre-tenure faculty members) were assigned to tables with facilitators, more or less by college, and asked to address the question "What actions could the University and/or departments take to help make a successful faculty member? These can be things that are already working well for you, or things that you don't have but feel you need." After a few minutes of silently generating ideas and writing them on post-it notes, participants were asked to clarify their items and group the items into themes, then prioritize the top three or four actions and report back to the group. The most common themes and concerns that emerged were:
- Resources in general, including both personnel and financial
- More structured and accountable mentoring
- Specific and balanced feedback on performance (not just negative feedback)
- Supporting the whole person: Work-life balance issues and spousal support
- More supportive campus climate in terms of diversity, especially in regards to race and gender.

Input from the workshop was summarized and shared with deans and department heads.

Science and Engineering 2003-04 New Hire Cohort Interviews

The assessment director completed the longitudinal study of members of the faculty cohort who joined the Virginia Tech colleges of science and engineering in fall 2003. Analysis of the first three years of interviews yielded the following results:
- Three years is a relatively short time span, particularly given that many faculty members do not receive formal feedback regarding their performance until after the second year review.
- While issues of collegiality, climate, and time management were sources of both challenges and support for new engineering faculty members across the years, key shifts occurred in attitudes about performance expectations and about what is entailed in supervising the activities of a growing research team.

- Between the first and third years, faculty members expressed growing clarity about performance expectations. They continued to struggle with effective strategies to supervise team members, while maintaining personal standards of accuracy and quality.

The project concluded with focus groups in January-February 2008 as a "member check" to confirm analysis of the interview findings. The findings were presented at the annual conferences of the American Educational Research Association and the American Society for Engineering Education.

Impact of Work-Life Policies on New Faculty

The assessment team conducted interviews with faculty members hired at Virginia Tech in the 2006 and 2007 to assess the impact of new work-life policies initiated by *AdvanceVT,* particularly the dual-career resources, family friendly polices (e.g., stop-the-clock and modified duties), and child care options. Faculty members hired within the last two years were questioned to determine whether they were aware of the policies during the hiring process and after joining the university, had utilized these policies, or had concerns about the impact of the polices in recruiting or retaining them or future faculty members to Virginia Tech. In summary, participants expressed the importance of all of these policies in recruiting new hires to Virginia Tech. The policies seemed to be particularly critical in retaining new faculty. Respondents expressed a concern about learning of the availability of these policies and whether their department chairs and deans are knowledgeable about the policies. Some suggested a uniform process be in place to make new hires aware of these policies. The complete report is included as an attachment.

Leadership Development Program Assessment

Interviews were conducted between July 19th and August 3rd of 2007 with all three female faculty members who completed the *AdvanceVT* Leadership Development Program in 2006-07. A pre-test has been completed for the 2007-2008 cohort, and will be followed by a post-test when they complete the program in the summer of 2008. A summary of the interview findings is included as an attachment.

Leadership Development Lunches

Since 2005, *AdvanceVT* has been providing leadership development lunches for faculty members at Virginia Tech, covering a wide array of topics such as the roles, responsibilities, and rewards of being an academic leader and providing an opportunity to network with university leaders across colleges and departments. In year five, *AdvanceVT* conducted a cumulative evaluation of the leadership development lunches. Participants were asked to complete a survey to evaluate the usefulness and relevance of the faculty leadership lunches and to identify other potential topics. A total of 121 individuals attended one or more of these lunches, and 42 participants responded to the survey.

Many respondents noted the importance of networking with other female faculty members as an important function of the lunches. Furthermore, the ability to hear and ask questions about different perspectives on leadership was rated highly by survey respondents. Forty-five percent of respondents indicated that they were potentially interested in a leadership position at the university and 57% noted that the lunches were an effective approach to leadership development.

A qualitative portion of the survey gave respondents the opportunity to provide feedback on the leadership lunches. Below are several salient quotes from the survey:

> *"Interesting to see different pathways to leadership - not 'one size fits all'. Also interesting to observe different leadership styles and try to analyze which approaches would work for me personally."*

> *"I've enjoyed hearing how other women leaders came to their position as well as how they balance work-life issues."*

> *"Unfortunately, they make the realities of the pressures to advance crystal clear. It is disheartening that we (VT) are continually forced to raise the bar on faculty promotion based on research due to continued budget cuts. This cuts out a lot of REALLY great leaders who are currently mid-career, but not interested in clawing their way to the next promotion level. It is also impressive, yet intimidating, what a serious time commitment these administrative positions require. The great thing is that I feel I have the REAL data thanks to ADVANCE, and can make career decisions based on knowledge not perception."*

Research Seed Grant Evaluation

AdvanceVT research seed grants provide funding to support junior faculty developing a successful proposal for external research funding. Seed grant recipients were selected competitively by an interdisciplinary committee with representative from four colleges. In addition to research supplies, the budget may also include travel funds for visiting colleagues at other universities or funds for graduate student support to acquire data needed for writing more competitive proposals for external funding. Grant recipients received $10,000 from *AdvanceVT* and a matching amount from their college and/or department.

In May of 2008, *AdvanceVT* requested that the seed grant recipients for the previous academic year (2006 – 2007) complete an annual report to determine the impact of the research seed grants on recipients' research and career progression. Five of the six recipients responded, and a summary of the annual reports is attached.

Ph.D. and Postdoctoral Fellowship Evaluation

In year five, *AdvanceVT* asked Ph.D. and postdoctoral fellowship recipients to complete an annual report outlining their achievements during the 2006-2007 award period.

Fellowship recipients provided information on publications produced, grant proposals submitted, meeting and conference presentations, instructional activities, awards received, and collaborative initiatives launched during the reporting period, related to the fellowship. The purpose of this report was to evaluate the impact of the fellowships on the individual recipients and the progression of their research agendas and careers. The reports were collected and aggregated, and a summary is attached. Highlights include:

- Each Ph.D. and postdoctoral fellow (with the exception of one) reported at least one publication in preparation or published by the completion of the grant cycle. According to journal citation reports, fellows published in journals with medium to high impact factors.
- All except for one fellow applied for grants during the 2006-2007 award period. Postdoctoral fellows received $250,641 cumulatively in grant funding.
- Each Ph.D. fellow received awards during the grant period. One fellow received cash awards totaling $35,000.The other fellow won a presentation award and a graduate scholarship.
- *"Although I remain unsure whether I wish to enter academia following my degree, I have a much more astute idea of the types of institutions that I would be willing to work at and of the types of family-friendly and diversity programs of which to take advantage. Additionally, I believe that the because of the ADVANCE program, I will have a much stronger CV and application package when applying for jobs."* - Ph.D. fellowship recipient

Lessons Learned from Assessment during Year Five

- *AdvanceVT* conducted more systematic follow up with program participants as a result of input from the site visit team and external evaluators in year four.
- Consistent communication and implementation of new policies and services remains a challenge.
- Strategic use of assessment results helped to build support for institutionalization of *AdvanceVT* programs.

Training and Development Activities

Institutionalizing Change

Virginia Tech participated in the COACHE study and the survey results have been presented extensively at the university, including at new department head and academic leader orientation, promotion and tenure training, and the fifth annual "Advancing Diversity at Virginia Tech" conference. Discussions of the data have resulted in university dialogue regarding a potential new policy on teaching release for faculty during the pre-tenure period and more systemic efforts on mentoring.

In addition to policy work accomplished through the *AdvanceVT* work group and faculty governance structure, there were significant accomplishments on other issues identified by *AdvanceVT*, including childcare and dual career hires. The Co-PI /Associate Provost continued to play a key role in ensuring that these issues are addressed by the Provost's

Office and other university structures and committees. Increasing the number of high quality day care slots in the Blacksburg community has become a very urgent priority. A university task force, co-chaired by the former Assistant Vice President for Human Resources and the Associate Provost/Co-PI for *AdvanceVT*, has spent two years examining daycare programs on other campuses, developing a business model, securing commitment of private funding from college deans, and issuing a Request for Proposals. A letter of intent was signed in early June 2008 with a local day care provider, who plans to build a new facility on property owned by the Virginia Tech Foundation. If plans move ahead as hoped, the facility may open for fall 2009.

Significant Accomplishments for Year Five:
- The Provost and deans committed to providing financial support to *AdvanceVT* programs following expiration of the grant.
- The university is negotiating with a local childcare provider to increase the availability of childcare in the area. College deans, the university foundation, and other entities have committed funding for at least a five-year period to guarantee slots for Virginia Tech faculty and staff in the proposed new center.

College Liaisons

Year five saw the continuation of the *AdvanceVT* initiative with College of Science and Engineering liaisons. The idea for college liaisons was borrowed from the UC Irvine Advance program, but the role of the liaison at Virginia Tech is less formal than at Irvine. Dr. Nancy Ross, associate dean in the College of Science, and Dr. Eileen Van Aken, associate professor and associate department head of industrial and systems engineering in the College of Engineering, served as liaisons in their respective colleges. The college liaison role focused on enhancing the faculty search process and building community among women in the two colleges. Liaisons met with many departmental search committees as well as all female and many male candidates for faculty positions in their respective colleges to inform them of work/life resources at Virginia Tech and *AdvanceVT* programs and to answer any questions. The liaisons were not members of the search committees, and so were able to discuss possibly sensitive issues with candidates in confidence.

The college liaisons also hosted networking events for female faculty and graduate students in the two colleges. Structured discussions at the events focused on contributions and obstacles to faculty success at the institution.

Department Climate

Jack Finney, professor of psychology, associate dean in the College of Science and former department head, continued to lead this effort in year five.

Significant accomplishments for the year:
- Session on department climate at the fifth annual "Advancing Diversity at Virginia Tech" conference.

- Completion of the Department Climate Compendium, available at http://www.advance.vt.edu/Resources_and_Links/Department_Climate_Compendium_Final_050508.pdf. The document will also be made available in a searchable web based format.

Empowering Women as Leaders and Scholars

Leadership Development Program

Dr. Roseanne Foti, Associate Professor of Psychology, led a third cohort of tenured women faculty from across the university in an individualized leadership development program. Each participant completed an assessment of her current leadership skills with input from her colleagues, superiors, and subordinates. Dr. Foti worked with the participants to prepare individualized development plans and met with the participants for coaching sessions throughout the year. *AdvanceVT* offered a series of leadership lunch seminars that were also open to faculty campus-wide. Seminars addressed the roles of university leaders, including the vice-presidents for research and graduate studies, deans, associate deans, department heads, and university research center directors. To date, participants in the program have moved into a variety of leadership roles as assistant/associate department head, department head, and dean; others have taken on leadership of departmental committees and special initiatives. The third cohort of five women was selected in spring 2007 and included women from four colleges. *AdvanceVT* is in the process of following up with participants in previous cohorts to track their career progress and leadership aspirations.

The success of this initiative has led *AdvanceVT* to seek a PAID grant from the National Science Foundation. The proposed project, the Virginia Faculty Women's Leadership Network, takes the successful *AdvanceVT* Leadership Development Program and disseminates the model statewide in collaboration with the Virginia Network, a statewide organization of women administrators whose mission is to identify, develop, advance, and support women in higher education, and five partner institutions (including the Virginia Community College System). The program is designed to increase women's leadership aspirations and to prepare women for a wide variety of leadership roles in higher education, focusing on the transition from senior faculty to academic leadership. The coaching model and the collaborative nature of the project provide a unique opportunity to impact the careers of individual women and higher education institutions across state. This model is inclusive, emphasizing leadership components that are effective for both majority and minority women.

Goals of the proposed program are:

1. to increase the number of women faculty members who aspire to leadership roles in colleges and universities, especially from science and engineering disciplines,
2. to prepare a cohort of participants to be self-aware, confident, and effective leaders in academe using self-assessment, personal coaching, and skill building workshops, and by developing and carrying out a personal action plan, and

3. to build a network of diverse women faculty leaders within institutions and across Virginia who will provide support to one another as they pursue their leadership goals.

Leadership Fellowships

During year five, *AdvanceVT* continued the Leadership Fellowship program, providing funds for a senior faculty woman to carry out an individual leadership development project:

- Naira Hovakimyan, Professor, Aerospace & Ocean Engineering, led an effort to establish a process for continuous review and improvement of graduate courses supporting the core mission of the Virginia Center of Autonomous Systems (VaCAS) at Virginia Tech, which is to promote research related to control of autonomous systems.

In addition, during year five Dr. Mary Kasarda, Associate Professor of Mechanical Engineering, completed her leadership fellowship begun during year four working with the university's government relations office with support from *AdvanceVT*. A summary of her activities is attached.

Research Seed Grants

In year five, the fourth cohort of *AdvanceVT* research seed grant recipients began work related to the grant. The grant recipients were selected in year four, and included six junior women faculty members from across the university. The deans of participating colleges provide matching funds for this program. Previous recipients of research seed grants were asked to complete a report form describing their career progress and the impact of the research seed grant. A summary of this feedback is attached.

Increasing Representation of Women in Science and Engineering

During year five *AdvanceVT* continued its work with search committees and departments on successful faculty searches and hosted several visiting scholars.

Significant Accomplishments in Year Five:
- Hosted four visiting scholars during the 2007-2008 academic year.
- Began development of a database of potential faculty candidates, with a focus on candidates with diverse backgrounds, working with the Office for Equal Opportunity.
- Distributed information about faculty employment at Virginia Tech at several different events across the country.
- Co-sponsored workshops on recruiting diverse faculty and graduate students with the Office for Equal Opportunity as part of the fifth annual "Advancing Diversity at Virginia Tech" conference.

Advancing Women into Faculty Careers

Graduate Student and Postdoctoral Seminars

AdvanceVT hosted a series of lunch seminars for graduate students and postdocs on topics related to preparing for faculty careers:
- Preparing for an academic job search
- Academic job interviews
- Negotiating an academic job offer
- Your first year as a professor

In spring 2008, *AdvanceVT* conducted an annual evaluation of the graduate student and postdoc seminars. Each event was rated by attendees as good to excellent in terms of the overall quality and usefulness of the four events. Respondents rated "Getting started in an academic career: Perspectives from Teaching and Research universities" and "Effective grant proposal writing skills" as events they would be most likely to attend in the future. Respondents also noted that they would like to see seminars on mentoring, how to deal with a difficult advisor, differences between public and private institutions, and research employment with the government.

> *"These seminars and the AdvanceVT program have given me insight into the process of becoming and being a faculty member that I would not have gotten elsewhere. I extremely hope* [sic] *that AdvanceVT will be able to continue these seminars and workshops."* – Seminar participant

PhD and Post-Doctoral Fellowships

AdvanceVT Professor Terpenny and *AdvanceVT* project director Layne met with the year five PhD and post-doctoral fellows funded by *AdvanceVT* and their mentors to discuss their career development and future plans and ways to improve the *AdvanceVT* fellowship program. The 2006-2007 fellowship recipients were asked to submit reports describing the outcomes of their fellowships. A summary of these reports is attached.

Other Year Five Activities and Accomplishments

Building Community among Women
- Co-hosted a fourth annual fall welcome reception for women faculty and graduate students in collaboration with the Graduate School, Women's Center, Women's Studies Program, and the Organization of Women Faculty.
- Hosted two networking receptions for women faculty and graduate students in the colleges of science and engineering.

Building Awareness and Understanding University-Wide
- The 5th annual "Advancing Diversity at Virginia Tech" conference, cosponsored with the Office of Multicultural Affairs, was held on January 8 with almost 200 registered participants, the largest attendance yet. Featured speakers addressed an

inclusive excellence model for institutional transformation and the career concerns of pre-tenure faculty. Workshop sessions also focused on recruiting a diverse faculty and creating department climates that encourage faculty success. Follow-up sessions, held on January 9th, engaged pre-tenure faculty at Virginia Tech and graduate student recruitment coordinators.

- Hosted the University of Michigan's Center for Research, Learning and Teaching Players at the Lyric Theater on April 2nd, 2008. The Players performed an interactive theater presentation called *The Faculty Meeting*, which depicted faculty discussions involving important topics such as faculty search and promotion and tenure decisions and how gender dynamics and faculty rank influence the conversation and affect the participants.

- *AdvanceVT* hosted four leadership development lunches for university faculty. These lunches featured panels of leaders from the across the university speaking on topics such as career paths, leadership skills, and other issues women faculty often face.

- *AdvanceVT*, the Women's Center, and the Women's Studies Program of Virginia Tech presented a day of activities celebrating the 35th anniversary of Title IX of the 1972 education amendments to the 1964 Civil Rights Act. Topics and speakers included *Title IX and Women in Sports*, presented by Kelly Belanger, Associate Professor of English; *Title IX and Women in Science, Technology, Engineering, & Math*, presented by Debra Rolison, Naval Research Laboratory, Washington, D.C.; and *Past, Present & Future of Title IX*, presented by Debra Rolison, Fatima Goss Graves of the National Women's Law Center, Lauren Kamnik and Sarah Warbelow of the American Association of University Women, and Kelly Belanger.

Outreach

In year five, *AdvanceVT* team members made several presentations on campus and traveled across the country and internationally making presentations on program activities and assessment findings at a wide variety of conferences and meetings.

- Creamer, E. (2007). *Responses of Underrepresented Faculty Members to the 2003 AdvanceVT Work-Life Survey.* University Commission on Equal Opportunity and Diversity, Virginia Tech. Blacksburg, VA.

- Creamer E. (2007). *Concerns of Faculty Members from Underrepresented Groups.* Commission on Faculty Affairs, Virginia Tech. Blacksburg, VA.

- Creamer, E. & Saddler, T. (2007). *Factors that Influence Perceptions of Collegiality Among Faculty Members in Engineering and Other Disciplines.* Association for the Study of Higher Education Annual Conference. Louisville, KY.

- Saddler, T. & Creamer, E. (2008). *A Longitudinal Analysis of the Priorities and Challenges of Pre-Tenure Faculty in Engineering and the Sciences by Gender.*

Poster. American Educational Research Association Annual Conference. New York, NY.

- Creamer, E. (2008). *Improving Department Climate.* University of Michigan. Ann Arbor, MI.

- Creamer, E. (2008). *Improving Department Climate.* California Polytechnic State University. Pomona, CA.

- Creamer, E., Saddler, T., & Layne, P. (2008). *The Changing Nature of Job Demands During the First Three Years of Employment as a Faculty Member in Engineering.* American Society for Engineering Education Annual Conference. Pittsburg, PA.

- Hyer, P. & Thomas, G. (2008). *Transforming Faculty Careers Through Work/Life Policies and Programs.* College and University Work Family Association Annual Conference. Chapel Hill, NC.

- Layne, P. (2007). *Progressive Work/Life Policies for Faculty.* Society of Women Engineers Annual Conference. Nashville, TN.

- Layne, P., Johnson, A.T., & Hyer, P. (2008). *Policy Change Is Not Enough: Measuring the Impact of Work/Life Policies at a Research University.* Women in Engineering Programs and Advocates Network Annual Conference. St. Louis, MO.

- Layne, P. (2008). *Advancing Women Scientists and Engineers on Faculties in the United States.* International Conference of Women Engineers and Scientists. Lille, France.

Products

Publications

AdvanceVT developed and distributed five newsletters highlighting activities during the summer 2007 through spring semester 2008, accomplishments of women faculty at Virginia Tech, and statistics on women in science and engineering at Virginia Tech and nationwide. The newsletters are distributed in hard copy to university deans, center directors, and department heads as well as at *AdvanceVT* events, are sent out by email to work group and committee members and posted on the *AdvanceVT* website at http://www.advance.vt.edu/News_and_Events/Past_Newsletters.htm .

"Creating a Positive Departmental Climate at Virginia Tech: A Compendium of Successful Strategies" was created as part of the *AdvanceVT* Departmental Climate Initiative (DCI) in year five. The Department Climate Committee collected policies and practices from a variety of sources to provide department chairs and heads with

opportunities to learn about departmental issues at Virginia Tech, to understand more fully the ways in which these issues manifest themselves within departments, and to share both successful and unsuccessful strategies illustrative of the different approaches departments have taken towards promoting effective, efficient, and pleasant work environments.

The purpose of the compendium is to help make departments places in which faculty, staff, and students live, work, and prosper with the utmost success. It draws from results of an initial 2006 DCI survey, a follow up *AdvanceVT* workshop discussions of existing strategies, 2003 *AdvanceVT* survey data, a literature review, and materials from other institutions. The compendium focuses on five critical areas that emerged from these sources: creating a sense of intellectual community, providing for fair and full evaluations of staff and faculty, improving communications to insure clarity and mutual respect and understanding, building more effective departmental policies, and helping department members achieve an effective work-life balance. The compendium can be found at http://www.advance.vt.edu/Resources_and_Links/Department_Climate_Compendium_Final _050508.pdf.

Websites
The *AdvanceVT* website, www.advance.vt.edu, includes information about the Virginia Tech Advance leadership team, accomplishments of women scientists and engineers at Virginia Tech, upcoming activities, a description of *AdvanceVT*'s assessment plan, and informational resources for women graduate students and faculty. The site includes a copy of Virginia Tech's Advance proposal to NSF and links to the NSF Advance website as well as websites belonging to the other NSF Advance Institutional Transformation grant recipients. Annual reports, data from the faculty survey, and other institutional data on women in science and engineering are also posted on the *AdvanceVT* website. During the summer of 2007, the *AdvanceVT* web site was redesigned to incorporate Virginia Tech's new website design templates. During 2008 the site will be converted to the university's new web content management system.

The Dual Career Assistance Program web site was redesigned with new information added as part of an overall redesign of the Human Resources website.

The Advance portal website, www.advance-portal.net, was maintained and new links were added as they were provided by other ADVANCE programs.

Attachments

Evaluation Reports:
        Impact of Work-Life Policies on New Faculty Hires: 2007-2008
        2006-2007 Leadership Development Program Evaluation
        2006-2007 Research Seed Grant Evaluation
        2006-2007 Ph.D. and Postdoctoral Fellowship Evaluation
        2006-2007 Leadership Fellowship Report

Quantitative Indicators of Activity and Progress

Year Five Financial Report

***AdvanceVT* Annual Report**
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Evaluation Reports

AdvanceVT
Impact of Work-Life Policies on New Faculty Hires
2007 - 2008

The assessment team conducted interviews with recently hired faculty members at Virginia Tech to assess the impact of new work-life policies initiated by *AdvanceVT,* in particular the impact of the dual-career assistance program, family friendly polices (e.g., stop-the-clock and modified duties), and child care options. Faculty members hired within the last two years were questioned to determine whether they were aware of these programs and policies, had utilized these policies, or had concerns about the impact of these polices in recruiting or retaining them or future faculty members to Virginia Tech.

This report discusses findings from the study. The first section outlines demographics of study respondents. The second section discusses findings related to the impact of the dual-career assistance program. The third section discusses findings related to family friendly policies and the last section discusses findings related to child care.

Demographics of Participants

Twenty-five faculty members (N=25) from various departments participated in this study. Faculty participants were recruited from the College of Agriculture and Life Sciences (e.g., agricultural and extension education, biochemistry, dairy science, food science and technology, horticulture, and nutrition, foods, and exercise), Architecture and Urban Studies (e.g., landscape architecture), the College of Business (e.g., accounting and information systems, finance, insurance, and business law), the College of Engineering (e.g., aerospace and ocean engineering, biomedical engineering, computer science, engineering education, materials science and engineering, mechanical), the College of Science (e.g., biological sciences, economics, mathematics, statistics), the College of Veterinary Medicine(e.g., biomedical science, large animal clinical sciences, small animal clinical sciences), the College of Liberal Arts and Human Sciences (e.g., apparel, housing, and resource management, communication, foreign languages, human development, philosophy, political science, school of education, theater arts), and the College of Natural Resources (e.g., fisheries and wildlife science, geography, and wood science and forest products).

Three respondents (n=3) were appointed fall 2006, six (n=6) were appointed spring 2007, and 16 were appointed fall 2007. Three participants (n=3) were appointed at the associate professor level and 22 at the assistant professor level. The sample was almost evenly split between men and women, with 13 men and 12 women participating. Only two (n=2) participants had previously worked at Virginia Tech before their current appointments. Five (n=5) respondents heard about the *AdvanceVT* program during their interview process or in some other way prior to their appointment. The majority (n=20) had not heard of the *AdvanceVT* program before accepting the position at Virginia Tech. Table 1 displays detailed demographics of sample participants.

Table 1: Demographics of Study Participants

Gender	
Male	13
Female	12
Rank	
Professor	0
Associate Professor	3
Assistant Professor	22
Tenure Status	
Tenured	3
Tenure-track	22
Date of Employment	
Fall 2006	3
Spring 2007	6
Fall 2007	16
Worked at VT Previously	
Yes	2
No	23
Heard About *AdvanceVT* program*	
Yes	5
No	20

Note. Fall 2006 includes October-December 2006, Spring 2007
includes January-July 2007, Fall 2007 includes August 2007.
*Indicates participants who heard about the *AdvanceVT* program during
the campus interview process or in some other way (e.g., reviewed
website and/or brochure)

Dual Career Issues

Questions about dual-career asked respondents whether they had a spouse or partner
seeking employment at Virginia Tech or in the Blacksburg area at the time of their
interview. Participants were also asked if they explored the Virginia Tech website or if
they spoke to anyone in the Dual-Career office about opportunities for employment for
their spouse or partner. If respondents indicated that they did speak to someone in the
Dual Career office about employment opportunities for their spouse or partner, they were
asked to indicate who they spoke to, how knowledgeable this person was about available
services, and how supportive, overall, did the person they spoke with seem to be about
the partner hire. Participants were finally given the opportunity to add any comments or
suggestions they wished about the impact of dual-career hiring programs on the
recruitment and retention of faculty.

Approximately half of respondents (n=13) indicated having a spouse or partner also seeking employment at Virginia Tech or the Blacksburg area during their interview process. Fourteen (n=14) explored the Virginia Tech website for opportunities for their spouse or partner and ten (n=10) spoke to a representative in the Dual Career office or saw the Dual Career office brochure. Most newly hired faculty members (n=12) indicated speaking to their department chair or faculty colleagues about employment opportunities for their spouse or partner, with most (n=9) indicating that their department chairs were very supportive about the partner hire process. For those participants who had been in touch with the dual-career office, most indicated that the person they spoke with was less helpful in their search for employment for their spouse or partner.

Overall, respondents indicated that dual career hiring policies are important in the recruitment of new hires. Four (n=4) mentioned that this service did influence their decision to accept a position at Virginia Tech. Many indicated not being aware that dual career services were available to them. Consider the following selected quotes about the transparency of dual career policies, the importance of such policies, and participants' satisfaction with the policies.

> *"They should put more information out—who should you contact if you are looking for job, etc."*

> *"I think that letting people know the way it works might make things easier. I have noticed among other junior faculty that—it seems like making the process more transparent might help people understand what's going on. I have heard of a couple of cases where somebody was not able to be retained by VT because a dual career hire did not happen. I know that there were very good reasons why that did not happen, but the perception was very negative on the part of the person who felt that no attempt had been made, when in reality there had been very serious attempts made to make things work out and it was just impossible to work out."*

> *"It's really critical. The problem is, is that a lot of people I have met, including myself, when it comes down to really facilitating/finding something for your husband, after you are hired, you are kind of on your own. Unless you force it, or you won't come, I don't think there is much meditational support after you are here."*

> *"My expectation would be that they would help her find a position. I was a little bit disappointed. I have not really looked into the roles and responsibilities of the office, so I don't know if that is something they are supposed to do. I felt they would be a little more proactive in helping her identify positions."*

Table 2 lists detailed information about participants' responses for dual-career policy items.

Table 2: Dual-Career Issues

Spouse/Partner Also Seeking Employment at VT	
Yes	13
No	12
Explored VT websites for Job Opportunities	
Yes	14
No	11
Spoke to Representative in Dual Career Office/Saw Brochure	
Yes	10
No	12
Individual New Hire Spoke To	
Dual Career Office (Beverlyn Samuels)	3
Department Chair/Faculty	12
HR in county	2
How Knowledgeable Were Individuals About Services/Programs	
Not knowledgeable	3
Somewhat knowledgeable	1
Knowledgeable	3
Very knowledgeable	4
How supportive Were Individuals About Partner Hire	
Unsupportive	2
Somewhat supportive	2
Supportive	1
Very supportive	9
Availability of Dual Career Services Influenced Decision to Accept Position at VT	
Yes	4
No	5
Somewhat	1

Note: Dual career questions did not apply to all participants

Other Family Friendly Policies

The next set of questions related to participants' awareness of and satisfaction with two particular family friendly policies—stop-the-clock and modified duties. Both policies are available to men and women and provide flexibility in the case of illness, childbirth, or family emergencies. Stop-the-clock polices are automatic in the case of childbirth or adoption. Modified duties policies are available in the event of unexpected personal or family circumstances.

A majority of participants (n=20) were aware these policies existed. Eight found out about the policies during the interview process and five (n=5) indicated finding out about them some other way. Most (n=9) indicated that these types of policies were also available at other institutions where they interviewed. The availability of these policies influenced some of the participants' (n=8) decision to accept a position at Virginia Tech. Table 3 lists specific responses for family friendly policy items, and the following quotes describe participants' impression of the policies and the transparency of the policies.

Table 3: Other Family Friendly Policies

Aware of stop-the-clock and modified duties policies	
Yes	20
No	5
Policies Discussed During Campus Visit or Found Out Some Other Way	
Yes	8
No	12
Some other way	5
Policies Available at Other Institutions Where Interviewed	
Yes	9
No	9
N/A	8
Availability of Policy Influenced Decision to Accept Position at VT	
Yes	8
No	17

> *"That was one of the reasons I chose VT because eventually I would like to start a family and knowing that I had the flexibility to do that made me feel that work-life was actually valued here."*

> *"They are especially important to me in terms of retention. The job that my husband found is about an hour away from Blacksburg. So, I commute. So, policies that will add flexibility to both my stop the clock and modified duties, if we are going to have a family are going to be even more important because there was not work for him at the time we came to Blacksburg. This will certainly contribute to my retention."*

> *"I thought it was really good and I was really glad the dean shared it with me. I also thought it would be better known by everyone. When I interviewed I got the perception that everybody knew about this and it was very clear and obvious, and then once I accepted the position here, it turned out that not everybody knew about it. That was a little puzzling for me. You know what I mean. You have a picture and then when you get here, people are like, "oh, really?""*

"I think they are really good. I think there should be a way to advertise them a little bit more. Maybe if I was a female those things would have been talked about a little bit more. The answer is kind of tricky. You don't want to cross certain boundaries during the interview. Maybe, if they were given in a brochure."

"I think that it's something that could be made more visible. I've heard about it, but I don't really understand and I've gone to the website—but it's kind of hard to find the information."

"These policies are crucial to recruit younger people who value both their professional careers and their family lives and people who value flexibility. I am on the older edge of generation X, but the things you hear about younger people is, the more flexible the better and sometimes in a higher ed institution we kind of cling on to old ways because that's the way we did them."

Child Care

Study items related to child care asked respondents whether child care was an issue for them before accepting their positions. If child care was an issue for participants, they were then asked to identify whether they explored child care options, how child care options compared to options they explored elsewhere, and if the availability of child care options influenced their decision to accept a position at Virginia Tech.

Six (n=6) participants indicated that child care was an issue for them before accepting their positions. Of those, five (n=5) participants investigated child care options in Blacksburg and the surrounding communities for child care. All respondents reported being dissatisfied with the options available to faculty and their frustration with finding appropriate childcare. Three reported that the availability of child care was an important factor in their decision to accept a position at Virginia Tech. Items in the child care section were the most variable in terms of being applicable to participants. Even though the child care items did not apply to all participants in this study, some were able to comment on their impressions of child care availability and policies. Table 4 lists specific responses about child care items, and selected quotes from participants are included to describe their experiences with child care options and their impression of child care policies.

"We looked around—we spent two months finding a day care. Both me and my wife are working, so it affects us."

"VT has a daycare also, but there is a waiting list. They should make some priority for new hires. That could help recruit new people here."

"No, but it did change how long of a maternity leave I had to take—I was forced to take. I was forced to take a 4 month maternity leave, which was fine for me as a Mom, but it was not ideal for the working world."

Table 4: Child-Care Policies

Was Child-care an Issue	
Yes	6
No	19
Investigated Child-care options Before Accepting Position	
Yes	5
No	7
N/A	13
Child-care Options Compared to Options Elsewhere	
Comparable	0
Not comparable	2
Poor	5
Availability of Child-care Options Influenced Decision to Accept Position at VT	
Yes	3
No	2

Note. Child-care questions did not apply to all participants

"Poor at best. The other institutions had a much greater availability."

"Equally bad and worse than some other places. There is a scarcity here that I don't understand. I was lucky to get my son in the lab school, which I think is really wonderful. But my baby daughter is not even in Blacksburg, she's in Christiansburg."

"Terrible—If we knew this, we might have not come."

"I accepted it not knowing what's going on. In general, childcare is available, but here it is not an option—it's just not available. That would have influenced me in getting a job. I had to bring my mom to take of my daughter. She's temporarily here."

"It's going to become an issue. I know numerous parents that take their children to several different day cares because they can't get their children into the same daycare. Not to mention, the day care that is available is poor at best. There are very few, in my mind, and I am very picky, quality day cares in Blacksburg or in surrounding area. It is certainly going to impact the recruitment and retention of faculty. I could almost guarantee that. Rainbow Riders is considered the premiere day care and they have told me that he (my son) will definitely not get in the subsequent year (he has been on the waiting list for two years). So we are talking about a three to four year waiting list for the premiere day care and that to me is unacceptable. If VT wants to retain faculty members, they are going to have to do something about it because, right now, the only daycare that Evan got into is in the complete opposite direction to where we live. We live in Ryner—it's a fifteen

minute drive here, but I drive 15 minutes past Blacksburg to drop him off and pick him up, so it takes me an hour—which is very wearing. To think that if we have another one, we would have, may have to put the second child in another day care. Well, that adds another stop at another location to my commute. You now just spent two to three hours on the road everyday."

"The university should make an attempt to indicate to new faculty that they will provide some funds for that. The childcare in Blacksburg is cheap as compared to other places in the US, but if you are forced to hire a private sitter, you have to pay more than what others are paying, so to compensate for that, the university should have some type of system established for that. In general, if you have to hire somebody, it will cost you $300 more than sending your child to child care. There are no other options, I cannot take my kid to work, someone has to take care of your kid."

"If I had a need for it, it would make a huge difference. It would make a difference as to whether I could keep my job. It's not just retention in the sense of people wouldn't be unhappy, but it also, if you are a tenure track faculty, you have to do a significant amount of research. So, having child care available would be a necessity."

"It's really important. It just surprises me that there is so much interest in women, but when they recruit they fail to tell them at all—"hey get here, but for two weeks before school starts, there is no child care. Everybody closes and goes on vacation, so you are stuck." It was awful. I got here and no one told me that there was a hiatus for childcare. I had no where to take my child. I was starting as a new faculty member. There was little connection with anyone about what I should do, what I can do. It was pretty much my own problem. I actually spoke to the provost about the issues of enabling women/advancing women—to try to develop a more constituency within the university. There is just no recognition for the single most important thing to women when they start working and that's what to do with their children, and what's going to happen when they come. That issue that all of the childcare facilities are closed for the first two weeks before school starts is not even discussed or noted. Your department chair gives no information. There is no procedure. It's all individual, it's up to you. For real change to occur, for real support and real facilitation to occur with women—it has to be an institutional process, not a personal decision of whether someone is interested in the program and chooses to share it and whether or not they even think it's important. What that means, is the faculty member's experience will be divergent from individual to individual."

"There were a couple of different schools that I interviewed. Some of the schools were really knowledgeable about childcare, they were aware that childcare would be important. I can only do a good job at work if I feel comfortable about where I leave my kid during the day. So, during the interview, some school brought me to their childcare centers and I was able to talk to some of the people there. There

*were some schools that basically guaranteed a spot for your child if you came in
as a new faculty member. Those are very, very important considerations,
especially for me. I did not find that here, at all. My department head and the
people that I interviewed here did not have children in their way; they couldn't
help me with the childcare questions at all. I contacted the childcare office here
and they basically just gave me a list of daycares, but they were really not very
informative. I then tried to contact day care centers here, and even the day care
center at the university was basically like, there's a waiting list—a couple of
years. I felt like I should have signed up my kid when I wasn't even sure if I was
going to work here. It's really, really a big issue."*

Summary

In summary, participants expressed the importance of all of these policies and programs
in terms of recruiting new hires to Virginia Tech. The policies seemed to be particularly
critical in retaining new faculty. Respondents expressed a concern about finding
information about the availability of these policies and whether their department chairs
and deans are knowledgeable about the policies. Some suggested that a uniform process
should be in place to make new hires aware of these policies.

Of all of the issues discussed, child care seemed to be the issue that concerned
participants the most. Some noted that child care was not a concern at the time of their
hire, but will become a concern if they decide to have children. Those who currently have
children expressed having to find child care outside the Blacksburg area and this factor
impacting their commute to work daily. Overall, participants wanted more attention to be
given to the issue of child care for faculty members.

In light of participants' responses and concerns, several immediate practical
recommendations are suggested. While some participants acknowledged being made
aware of certain faculty policies during the interview process, all were not. This suggests
that polices are not being openly discussed as a routine part of the hiring process. Hiring
teams and department heads can provide literature and direct new hires to websites
especially designed for highlighting such policies so that new hires can easily access
information about these policies.

Not only should policies be highly visibility during the interview process, but information
should be provided again at the appointment process. Such policies could be a part of a
"check list" of information that new hires sign off on during the appointment process
indicating that they have been made aware of these policies and understand them.

More resources could be made available to increase the availability of child care services
for new hires who have children. This would show new hires (as well as current faculty
members with children) that the university is concerned about these issues and is
interested in retaining faculty. Clearly, the child care services provided by the university
did not seem to be enough and the services in the Blacksburg area did not seem to be
adequate. Channeling more resources to child care services would remedy this concern.

Leadership Development Program Evaluation
2006-07 Participants

Interviews were completed with all three female faculty members who completed the *AdvanceVT* Leadership Development Program in 2006-07 between July 19th and August 3rd of 2007. Participants were asked whether they would prefer to be interviewed over the telephone or in person. Two interviews were completed in person and one over the telephone. At the completion of the interview, the researcher typed up field notes from the interview, and the field notes for each interview were sent to each participant for review to ensure that their comments were accurately represented. Participants were instructed to make any changes to the field notes as they saw fit. Minimal changes were made to the field notes, reflecting the quality of the data.

The following is a summary of the responses to the interview questions. Report summaries are presented in the form of "majority" and "minority" responses. "Majority" responses indicate that two or more of the participants noted this experience. "Minority" responses indicate that only one participant expressed the idea or had noted the experience.

Question #1: What motivated you to participate in the *AdvanceVT* Leadership Program?

Participant responses:
- To develop personal skills (i.e., personal capabilities/abilities, become more well-rounded)
- To develop professional skills (i.e., leadership skills)
- I was supported by my department chair to participate

Quote: "The program was instrumental in my success here. I knew I could learn more professionally by participating in the program. I hoped it would make me well-rounded".

Question #2: What types of skills did you hope to acquire by participating in the program?

Participant responses:

Majority:
- To improve communication skills
- To improve conflict resolution skills

Minority:
- To increase participant's assertiveness
- To increase participant's ability to do strategic planning
- To improve sense of (personal) confidence

Quote: I hoped to increase my assertiveness, increase my communication skills, and to increase my strategic planning. We really did not address this last one, but other areas of the program more than exceeded my expectations.

Question #3: On a scale of 0-10, with 10 meaning "exceeded your expectations" and 0 meaning "it fell short of your expectations," to what extent would say the program has met your expectations?

Participant responses:

Majority: Program met or exceeded expectations
- 8 – The 360 program was enjoyable.
- It connected participants to new and different resources.
- 9/10 - The program was well structured.
- Meetings with project leader/coach were useful.

Minority:
- More meetings dealing with professional image issues (i.e., dress, body language, how to address larger male crowds) would have been helpful

Quote: It was valuable to have one-on-one time with a coach (an unexpected benefit of the program). The 360 survey was helpful to learn about others' perceptions of my capabilities.

Question #4: In what ways has the program influenced your goals for leadership positions in the future?

Participant responses:
- Increased participant's confidence level to pursue a leadership role
- Initiated dialogue about leadership possibility
- Helped me deal with complicated issues with diplomacy and patience

Quote: It's kept me open to the possibility of going into leadership. It has opened the dialogue, but I still need to be careful about what I am taking on.

Question #5: What part of the leadership program have you found to be most personally valuable?

Participant responses:
- 360 analyses with project leader
- Personal dialogue with project leader
- Development workshops (i.e., writing with CEUT)

Quote: I worked with XX in the spring to improve my writing skills (focusing on the writing process). These workshops helped me move forward more efficiently with my NSF research grant and several journal papers.

Question #6: What part of the leadership program has been least valuable or useful to you personally?

Participant responses:
- Networking lunches (minority response-1)

Quote: Overall, it was a net positive gain for me. I did not waste time participating in the program.

Question #7: Can you identify any tangible outcomes to your own career that you attribute in whole or part to your participation in the leadership program?

Participant responses:
- Participant took the lead in developing a new policy for department
- Too soon to answer
- Program has made participants think more concretely about leadership positions in the future
- Training received directly applied to proposal writing project

Quote: I am working on a National Science Foundation (NSF) proposal—so the training I received from XX directly applied to writing that proposal. I also completed and submitted a journal paper for review, and I also revised a journal paper for review. The impact is there and will continue in the future.

Quote: In part, my participation fell nicely with a summer leadership program at Harvard I participated in. Research leave in the fall also allowed me to pursue leadership development. It gave me directions about where my leadership should go. I took the lead in developing a graduate student annual review policy. Creating contracts and statements of expectations [for graduate students] makes it easier for evaluating them. The annual review and my use of contracts resulted, in part, from a point that came up from the 360 report—that I avoid conflict.

Question #8: If you had to do it all over again would you participate in the program?

Participant responses:

Majority: Yes
- Timing was convenient
- Useful even if participants do not have administrative aspirations

Quote: The timing was good. I would participate again.

Question #9: What advice would you offer other Virginia Tech women who are considering participating in the program?

Participant responses:

- Women from across disciplines would benefit from the program.
- Be ready to see how others perceive you.
- It will open your eyes to other opportunities you might not have realized.

Quote: I come from Social Sciences. I understand the rationale for engineers [to be targeted by Advance], but women across disciplines would benefit from participating in this program.

Question #10: Do you have any suggestions about ways the program can be improved?

Participant responses:

Majority response (2):
- Networking between cohorts with a specific objective

Minority response:
- Requirement for participants to meet once a month to share experiences and for support
- More compensation for project leader/coach
- Formal inclusion and compensation for outside project supporters (i.e., CEUT)

Quote: Locally, have cohorts interact with other (previous) cohort members. For example, cohort number 1 and number 3—see how program is influencing us. Networking among cohort groups once a year would be nice.

Question #11: Have you actively applied for a leadership position within or outside of Virginia Tech during the past year?

Participant responses:

Majority response: No (2)
- Two participants indicated that they will wait 5 to 10 years before applying for a leadership position.
- One participant serves a PI for a grant (research leadership), but has not pursued an administrative leadership position.

Quote: No; This is related to advice I have been getting about making associate and then full professor before taking leadership positions. To take a lateral move and then get promoted would put me in a vulnerable position. So, it would be another 5 years before I pursue an official leadership position. However, improved leadership skills benefit all my roles at the university.

Question #12: Are you applying for a leadership position in the near future?

All participants indicated that they will not be applying for a leadership position in the near future.

Question #13: Is there anything else you would like to share about your experiences in the leadership program?

Participant responses:
- Leadership skills have benefited my department as a whole
- Incorporating the Myers Briggs personality inventory may be helpful for future programming efforts

Quote: I am grateful for the opportunity. I have benefited. My department has seen changes in me. My leadership skills have benefited the department as a whole.

Summary and Suggestions

All participants indicated being satisfied with the program and that they benefited from participating in it. The experience overall was a very positive one for all participants. Participants cited the timing of events as being convenient and the personal, one-on-one time with the project leader as being the most valuable. Experiences with the project leader allowed participants to reflect on their personal abilities and skills and highlighted areas in leadership they could improve in.

While all participants indicated that their leadership skills and confidence to pursue leadership opportunities increased, none of the participants expressed a desire in the near future to pursue leadership positions. This decision was mostly due to advice given about promotion within faculty ranks. Participants felt that it would be more beneficial to be promoted within their current position before entertaining an administrative leadership position. There also appeared to be a little disillusionment about administrative roles being more involved than originally imagined. All participants did indicate the possibility of pursuing leadership roles in the future. It is important to note that leadership in other forms was pursued by two participants. While not administrative, taking on leadership within a department by developing a new policy or serving as a principal investigator for a grant was indeed attributed to the skills developed by participating in the program.

To increase collegiality and networking opportunities between current cohort participants and previous cohort participants, respondents suggested more structured meetings for interaction and information sharing. Participants seemed to express a need for interacting with, supporting, and encouraging fellow participants and learning from previous cohort members.

Overall, the impact of the *AdvanceVT* Leadership program is beneficial to faculty members involved. In addition, the leadership of the program is instrumental in the program's success as noted by current participants. Suggestions for future program efforts might include more interactive (both formal and informal) sessions with current

and previous cohort participants. This would encourage continued networking and support for program participants.

Considering the concern of participants to delay pursuing administrative leadership positions early or mid-way in their faculty career, there may be a need to revise the leadership program focus. For example, the program could focus more broadly on leadership development to include more areas (and examples) of how participants can pursue leadership in addition to their current teaching and research roles.

Seed Grant Recipient Follow-Up Report
2006 – 2007 Award Period

AdvanceVT research seed grants provide funding to support junior faculty developing a successful proposal for external research funding. Seed grant recipients were selected competitively by an interdisciplinary committee with representative from four colleges. Grant recipients received $10,000 from *AdvanceVT* that was matched by their college and/or department. In addition to research supplies, the budget may also include travel funds for visiting colleagues at other universities or funds for graduate student support to acquire data needed for writing more competitive proposals for external funding.

In May of 2008, *AdvanceVT* requested that the seed grant recipients for the previous academic year (2006 – 2007) complete an annual report to determine the impact of the research seed grants on recipients' research and career progression. Five of the six recipients responded.

The preparation of a proposal for external funding was a major goal of the seed grant. All but one of the recipients who reported has submitted proposals for external funding, either as PI or co-PI. One recipient was especially successful, receiving over $400,000 in external funding. Under a collaborative effort with researchers from other universities, one recipient reported receiving NIH funding in excess of $1,000,000. Several recipients still have proposals pending related to research conducted under the seed grant. Two recipients listed the NSF Career award as the desired target for that funding. However neither recipient has prepared a proposal for the NSF Career Grant to date. Two recipients provided information on awards received from national associations in their fields for research related to the grant.

The seed grant recipients also noted in their original proposals the importance of attracting high quality graduate and undergraduate students to support research goals. All but one of the respondents listed a graduate student or undergraduate student who supported fieldwork, lab research, or outreach programs under the seed grant. One respondent reported having both undergrad and graduate student support. The students, while providing research support, also undertook study under the recipient, and often published results related to the grant or completed a thesis or dissertation.

Collaboration, another key to the seed grant, also emerged as an endeavor undertaken by each recipient. Several recipients reported developing interdisciplinary collaborations across the university. Others reported developing cooperative arrangements with faculty at other universities, both nationally and internationally, and still others developed these relationships with key figures at national laboratories.

Most of the recipients stated as a goal in their seed grant proposals the production of publications, presentations, or instructional activities in order to raise the profile of the faculty member both on campus and in their field of study. Each respondent reported having either presented at conferences, produced publications in high impact journals

and/or participated in outreach in their subject area. Graduate and undergraduate students funded under the grant were instrumental in these efforts and were often listed as first or second author on related publications and presentations. Several of the students conducted research for their degrees related to the research supported by the grant.

Several of the seed grant recipients highlighted travel as key to their research. The funds provided by the grant facilitated recipient travel to conferences, to conduct collaborative efforts, to conduct fieldwork and to fund student travel. Each recipient noted the importance of this travel to the overall success of their research programs.

Seed grant recipients provided the following statements about the impact of the grant on their careers:

> *"The [subject of the seed grant] is now a major focus of my research. I will be resubmitting my NIH R21 proposal for funding in November [2008]. In the meantime, I am collaborating with [XX] and [YY] on an HEV project in the chicken model that has been funded by NIH. With this project I now have a technician and graduate student who are focused on studying this aspect of the disease."*

> *"The seed grant allowed me to explore a new research area that I would normally not be able to explore due to lack of resources. It was essential in the establishment of a collaboration with [XX] that gave us the ability to meet several times in order to sync our research results."*

> *"[ ] the focus of my 2006 AdvanceVT award, is my main research focus at this time. I am continuing to seek out funding for a larger project, which will be an extension of my seed grant proposal. I have a new collaborator, [XX], who was able to fund further fieldwork in the Dominican Republic this year from one of his grants, while we await news on our revised NSF proposal ... I was able to attract an excellent female MS student for Fall 2008, who is interested in my ongoing [ ] research in the Dominican Republic. I was also able to obtain funding to pay an undergraduate to do laboratory work last summer on the sediments I collected during my AdvanceVT- funded fieldwork. This was excellent training for him and he is going to work for me again this summer performing similar analyses on my new data from this year's fieldwork.*

> *I have begun to carve out a new niche for myself in the emerging field of [ ]. After presenting result of my AdvanceVT project, I was invited to serve on the Executive Committee of the[ ], and chaired a special session at the annual meeting of the[ ]. I feel that my profile as a [ ]scientist has been raised in part due to my award."*

> *"The topic of the Advance seed grant has become a major component of my current research program on [ ]. The seed grant helped in obtaining important preliminary data to receive funding by an USDA NRI grant which in part*

investigates the[ ]. I currently have one postdoc and three graduate students whose projects are fully or in part related to the topic of the seed grant. I plan to submit an NSF CAREER grant this summer which will entirely focus on [ ]. In summary, the Advance seed grant was very helpful in launching my research program and getting federal grant funding.

Both of my graduate students, [ ] and [ ], received best poster awards at the Biological Sciences Research Day in spring 2007 and 2008. [grad student] was invited at this year's research day for an oral presentation of her research on [ ]. In addition, she received a departmental John Palmer research scholarship this spring.

I participated as a research mentor for MAOP student [ ] in summer 2007. She gave a poster presentation at the MAOP Summer Internship Research Symposium on the topic of [ ]."

AdvanceVT
PhD and Postdoctoral Fellowship Recipient Evaluation Report
2006-2007 Award Period

AdvanceVT has awarded PhD and Post-doctoral Fellowships in 2004, 2005, 2006, and 2007 to outstanding graduate students and recent PhD recipients preparing for faculty careers. In 2006, *AdvanceVT* awarded two PhD fellowship grants and four Postdoctoral fellowship grants. These fellowship grants fall under the program element of *Advancing Women into Faculty Careers*. Increasing the number of doctoral-prepared women scientists and engineers for faculty positions is important since success in building a critical mass of women on the faculty is a function in part of availability. The measurable outcome of this program element is a significant increase in the percentage of women in engineering and the sciences who choose faculty careers.

The program offers an academic-year fellowship to participants who spend the year completing their dissertations (Ph.D. fellow), teaching a course, conducting research, and interacting with faculty and the university community in a pre-faculty mentoring experience. Each fellow developed and proposed a mentoring plan with a faculty member as part of the application process. Elements of this mentoring experience could include presenting research at conferences, teaching a course, submitting grant proposals, or mentoring an undergraduate student.

Grants recipients were asked to submit an annual report outlining achievements made during the 2006-2007 award period. The report, in line with *AdvanceVT* principles, requested grant recipients to provide information on a variety of topics, each related to or produced during the reporting period of the fellowship grant. This included descriptions of publications that were produced related to the grant; grant proposals submitted; presentations given; instructional activities; awards; and collaborations launched during the reporting period that were related to the purpose of the fellowship grant. The purpose of this report is to evaluate the impact that the grants had on the individual recipients and the progression of their respective research agendas and careers. Outcomes will be related to each fellowship recipient's individual mentoring plan.

Related Publications

Ph.D. Fellows

Neither Ph.D. fellow identified the production of publications as a part of their mentoring plan, yet each submitted publications during the grant period.

Each fellow reported at least one publication in preparation. One fellow reported two first author articles in review, one in a refereed journal. The other fellow reported one article in press and another under revision, both as second author. Journals published in and submitted to included *Journal of Environmental Quality, Herpetological Review,* and *The Wildlife Professional*. Journals submitted to had low to medium impact factors. Impact factors are measure of the citations to science and social science journals. It is frequently

used as a proxy for the importance of a journal to its field (cites to recent articles/number of recent articles = impact factor).[1] For example, the *Journal of Environmental Quality* has an impact factor of 2.272 and is ranked 29th. For comparison, *Frontiers in Ecology and the Environment*, a comparable journal, has an impact factor of 4.842 and is ranked 2nd in the subject matter.

Postdoctoral Fellows

Each fellow included the publication of articles in top-tiered journals as a part of their mentoring plan, with one exception.[2]

Each fellow, except for one, had 1-2 publications either in preparation or published by the completion of the grant cycle. Fellows consistently held first authorship. Journals published in included *Ornitologia Neotropical* (0.260 IF, ranked 17th), *Ecology* (4.782 IF, ranked 7th), *Journal of Biochemistry* (1.963 IF and ranked 164th*), and *Inorganic Biochemistry* (no IF or rank).

Related Grant Proposals

Ph.D. Fellows

Each fellow included submission of grant proposals as a part of her mentoring plan. Each sought opportunities to improve grant writing skills and developed plans to target specific grants.

One fellow received $600 from a university related research grant (Virginia Tech Graduate Research Development Project). The other fellow applied for seven total grants and received two (VT GRDP & TWS Travel fund) for a total of $670. Total grant funds received by Ph.D. fellows during the 2006-2007 award period is $1270.

Postdoctoral Fellows

Each fellow discussed, in one way or another, the need to obtain research funding in their fellowship application. In fact, most recipients expected to use the results of the grant as the foundation for competitive grant applications. The mentoring plans provided by the fellows' advisors underscored the need to help each fellow become successful through the transmission of grant writing skills and illustrating appropriate methodologies.

All but one fellow applied for grants during the 2006-2007 award period. Grant proposals were submitted to the National Institutes of Health, the National Science Foundation, Miller Jeffress Foundation, and the American Heart Association as either principal

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[1] Impact factors for this report were collected from Journal Citation Reports on Thompson Scientific, ISI Web of Knowledge online database.

[2] One postdoctoral fellow's project focused on a qualitative exploration of student/faculty mentoring. Due to the uniqueness of this project, the fellow's mentoring plan was substantially different than other fellows.

investigator or co-investigator. Fellows received, cumulatively, $250,641 in grants. At the time of the report, one fellow had a grant proposal out and pending for $1,419,421.

Related Presentations

Ph.D. Fellows

Fellows included in their mentoring plans the importance of presenting their research results at conferences and developing links with other researchers and educators across the country.

Both fellows participated in four presentations during the award period. One fellow focused research related presentations at local and regional levels, including one national conference presentation. The other fellow presented at two national conferences and at two local conferences.

Postdoctoral fellows

Presenting research was an important component of each mentoring plan. Mentors identified the need to help the fellow build confidence in their research, attending workshops on seminar presentation styles, and facilitating access to the research community. Mentors also included professional membership association meetings, regular research group meetings, and "journal clubs" as avenues to gain necessary presentation experience.

Only two fellows presented at conferences during the award period. One fellow was outside the country collecting data during the entirety of the period of the award and the other fellow did not present at all and did not provide information as to why. One fellow presented at two national and international conferences and was an invited speaker on one occasion. The final fellow presented at one national conference.

Related Class or Instructional Activities

Ph.D. Fellows

Fellows, as a part of their mentoring plans, included instructional activities at the university and mentoring of undergraduate students. One fellow enrolled in coursework at the university on pedagogical techniques in order to prepare for teaching opportunities. Fellows also enrolled in the Future Professoriate courses. One fellow sought constructive comments from her mentor weekly in order to improve her teaching skills.

One fellow acted as a co-instructor in biological systems engineering and the other fellow mentored several undergraduate students in fisheries and wildlife sciences. Each student presented research at regional conferences and one student submitted her work for publication. Additionally, one fellow organized forums for students, with participation of

faculty and administrators, on topics concerning work-life balance and negotiating academic positions for dual career couples.

Postdoctoral Fellows

Mentors identified participation in instructional activities as important to fellow success in obtaining future faculty positions. One fellow reported no related class or instructional activities. Two fellows were instructors of undergraduate courses. The final fellow mentored an undergraduate research project in biochemistry.

Awards

Ph.D. Fellows

Each fellow received awards during the grant period. One fellow won cash awards totaling $35,000. The other fellow won a presentation award at a regional meeting and a graduate scholarship, but did not indicate the amount of the scholarship.

Postdoctoral Fellows

No awards were reported by postdoctoral fellows.

Collaboration

Ph.D. Fellows

No collaborative efforts were listed by the Ph.D. fellowship cohort.

Postdoctoral Fellows

Developing collaborative initiatives were outlined in many of the postdoctoral applications, and indicated by mentors as important to future success as an academic. Two fellows did not report any collaboration launched during the reporting period. One fellow reported an international collaboration with faculty at Queen's, a Canadian university. The final fellow reported establishing collaboration with faculty at the University of South Carolina and collaborating across disciplines at Virginia Tech.

Personal Statements

Ph.D. Fellows

> *"The ADVANCE Fellowship gave me the opportunity to team teach a junior level class last spring, which was vital experience during the [faculty] application and interview process."* (This fellow has accepted an assistant professor position at a public university.)

"Although I remain unsure whether I wish to enter academia following my degree, I have a much more astute idea of the types of institutions that I would be willing to work at and of the types of family-friendly and diversity programs of which to take advantage. Additionally, I believe that because of the Advance Program, I will have a much stronger CV and application package when I begin applying for jobs."

Postdoctoral Fellows

"My fellowship grant has permitted me to diversify my research experience and begin developing basic knowledge and skills in science education research."

"I believe I have more of a leadership role in the laboratory these days."

"In addition to my appointment at Virginia Tech, I have recently been appointed Adjunct Assistant Professor at Queen's University."

"With the ADVANCE fellowship, I was able to start an independent research program; such experience is not often found among postdocs in my area of study. I'm currently applying for a faculty position at research institutions, and the fact that I have already started a research program and applied for grant support in the project gives me more confidence that I'll succeed in my academic career. Thanks to the ADVANCE program!"

AdvanceVT
Leadership Fellowship Summary:
An Opportunity to Learn and Contribute to Virginia Tech's Interaction with
Government at the State and Federal Levels
Mary Kasarda
Associate Professor, Mechanical Engineering
June 2, 2008

In my *AdvanceVT* fellowship, I worked directly with Ralph Byers, Executive Director of Government Relations for Virginia Tech (VT). During this fellowship, thanks to Mr. Byers, I was involved in a number of activities including the development of in-house documents to support the VT government relations mission, hosting of visitors regarding science and engineering issues for the president's office including arranging meetings across campus, attending a conference on Women in Virginia Politics, being appointed as a member of the Modeling and Simulation Committee of the Joint Commission on Technology and Science for the Commonwealth of Virginia, attending federal and state governmental functions as a representative of VT including Nano-Technology Day, a legislative breakfast hosted by VT, and the Virginia Agribusiness banquet in Richmond as well as a Congressional Reception co-hosted by VT and Virginia Commonwealth University on Capitol Hill in Washington, D.C. I also met legislators and their staffers, and learned more about the avenues for working with the government on various issues by observing governmental procedures and meetings.

An additional critical benefit of this fellowship was that because I worked in the president's office with Mr. Byers, I became more familiar with the executive administrators at VT, both personally and professionally, as we attended various functions and as I helped them with various tasks. It was a great opportunity where I increased my internal VT network and learned more about what specific responsibilities came with these administrative positions. An unexpected bonus was that I also increased my external network through this fellowship because I met and interacted with top administrators at other academic institutions in the state, elected officials, and executives from industries in Virginia including Northrop Grumman and Micron. In particular, one of my main motivations for applying for this fellowship was to help facilitate my goal of getting more engineering in K-12 classrooms. Learning the structure of the educational administrative system in Virginia as well as who the key players are was critical to this goal, and the fellowship has helped me do this. I will spend some additional travel funds remaining from the fellowship (the fellowship was cut short to some extent by the April 16th shootings at VT) to travel to Richmond to continue networking with officials in the Virginia Department of Education to continue to facilitate my professional goals including hopefully getting involved with additional committees at the state level.

In summary, this fellowship has resulted in multiple tangible benefits for me in advancing my career. I have expanded my internal and external network of administrators, elected officials, and business executives. I have also gained confidence in dealing with elected officials with regards to legislative issues that may come up regarding my goals, particularly in the area of getting engineering into K-12 classrooms. This fellowship has also increased the likelihood of me obtaining an administrative position and being successful in it. At the end of this fellowship, I definitely had a much

better understanding about government relations issues as well as the roles and responsibilities of executive administrators at VT. I am very grateful to the National Science Foundation and *AdvanceVT* for giving me this opportunity as well as Mr. Ralph Byers whose mentorship was critical to the success of this fellowship for me.

AdvanceVT Year Five Quantitative Indicators of Activity and Progress

As part of the reporting requirements of Virginia Tech's Advance Institutional Transformation award, the National Science Foundation requires a set of quantitative and qualitative indicators of project performance and impact on an annual basis. Virginia Tech is currently completing the fifth year of its Advance program. Where possible, indicators are reported with data from prior years for comparative purposes. The format for this annual reporting reflects the suggestions presented in the *Proposed Toolkit for Reporting Progress toward NSF ADVANCE: Institutional Transformation Goals*. Additional detail on tenure, promotion, and time in rank is provided through continued reporting of the cohort analysis that was included in *AdvanceVT*'s first annual report.

Indicators presented below include numbers and percentages of women scientists and engineers in various categories at Virginia Tech and analyses of gender effects on promotion and tenure, recruitment, and start-up packages. *AdvanceVT* continues to use these data indicators internally for program planning and with the university community in a variety of formats, including presentations to university administrators as well as in newsletters and on the *AdvanceVT* web site.

Faculty by Appointment Type, Rank, and Gender

Table 1 shows the number and percent of women faculty in the Virginia Tech Colleges of Science and Engineering by department, both the number and percent of women in tenure-line positions by rank and department, and the number of women in science and engineering who are in non-tenure-track positions. Percentages from the previous four years are included for comparison.

Only faculty in the standard academic ranks of assistant, associate, or professor are eligible to earn tenure at Virginia Tech. Administrators cannot earn tenure in an administrative appointment, but retain their tenure if earned previously as part of an academic appointment. In fall 2007, there were 315 tenured and tenure-track faculty in the College of Engineering, of which 41 (13%) were women. This is a significant increase from the fall of 2003 when there were 26 (9.4%) women. Nationwide, 11.8% of tenured and tenure track engineering faculty were women in 2007, according to the American Society for Engineering Education's "Engineering by the Numbers" report. Two engineering departments continue to have no women faculty on the tenure track (biomedical engineering and mining and minerals engineering).

The College of Science had 201 tenured and tenure-track faculty in fall 2007, including 35 women (17.4%). While the overall number of women faculty increased in the College of Science from 2006 to 2007, the percentage of women assistant professors actually decreased from 43% in 2006 to 39% in 2007, due to a large increase in men assistant professors (from 16 in 2006 to 25 in 2007).

The scarcity of women at the senior-most ranks remains an issue since low numbers of full professors mean the pool of experienced women available for appointments to

professorships and chairs and important policy making committees is very limited. The number of women at the rank of professor in the College of Engineering increased to 7 (5%) in 2007, from 6 in (4%) in 2006. The College of Science increased the number of women at the professor rank by 1, from 8 in 2006 to 9 women in 2007.

There are three other major categories of faculty appointments at Virginia Tech: administrative and professional (A/P), non-tenure track instructional, and special research faculty. A/P faculty in the two colleges are generally the deans and assistant/associate deans and professional staff for college-level functions. When A/P positions appear in departments, these individuals are typically professional fiscal officers or academic advisors. Both colleges have strong representation of women on the dean's staff. The College of Engineering has an associate dean for academic affairs and an associate dean of distance learning and computing, both are African American women. The College of Science has an associate dean of research, graduate studies, and outreach, a position currently filled by a female faculty member.

Non-tenure-track instructional faculty include individuals on visiting appointments, lecturers, or those on short or long-term instructor appointments. The College of Science has many more instructors than the College of Engineering, who teach many sections of lower division mathematics and science courses; about half of the non-tenure track appointments in the College of Science are in the department of mathematics. Women fill over half of these appointments college wide.

A growing category of employment at Virginia Tech is the special research faculty whose primary responsibility is sponsored research. There are a number of ranks used within the special research faculty category. These include postdoctoral associate, research or project associate, research scientist, and research professor, among others.

Faculty hiring during the period of the grant has been deeply affected by severe state budget reductions in 2002-2003, and to a lesser extent by new budget reductions imposed in 2008. The total tenured and tenure track faculty university wide decreased from 1418 in fall 2001, to 1331 in fall 2002, to 1262 in fall 2003; an 11% reduction. The reduction in administrative and professional faculty over the same period was 13.6%. Much of the loss was a result of an early retirement program offered as part of the university's budget reduction strategies. In addition, there were significantly more resignations for several years as faculty sought better opportunities and salaries elsewhere. In 2004, the university was able to begin rebuilding the faculty and a significant amount of new hiring has occurred. The number of tenured and tenure-track faculty reached 1383 in fall 2007, still short of the faculty count in 2001. (Source: IR website, www.irpa.vt.edu, file name: HC_trend_fa98-07_AllVT_final.xls)

Tenure and Promotion Outcomes by Gender

Due to low representation of women in the assistant, associate, and professor ranks in the College of Engineering and College of Science, few women are reviewed for tenure on a yearly basis. Table 2 summarizes the number of men and women in the College of

Engineering and College of Science who have been reviewed for either a promotion, tenure, or simultaneously reviewed for promotion and tenure for one year prior to receiving the Advance grant (2002-2003) and five years following its inception. All female candidates from both colleges have successfully met the criteria for promotion and/or tenure over the past six years.

Years in Rank by Gender, Promotion to Associate Professor

Table 3 summarizes the current status of faculty hired at Virginia Tech as assistant professors between 1996 and 2006, including attrition and time to promotion. During those 10 years, a total of 64 assistant professors were hired in the College of Science (44 men and 20 women) and 119 assistant professors were hired in the College of Engineering (89 men and 30 women). Of those hired, 34 have subsequently left Virginia Tech (15 scientists, four female and eleven male, and 19 engineers, five female and 14 male). Twenty percent of the female scientists hired during this period have been promoted to the rank of associate, compared with almost 52% of the male scientists. This is, at least in part, due to the fact that more male faculty are hired with prior experience and more women faculty stop the tenure clock.

Average time to promotion for assistant professors hired between 1996 and 2006 in the College of Engineering was 5.75 years for women and 5.53 years for men. In the College of Science, average time to promotion for women in this group was 6.25 years and for men 4.62 years.

Years in Rank by Gender, Promotion to Professor

Table 4a summarizes time in rank by examining scientists and engineers hired during 1996-2006 as assistant professors who have been promoted to professors. Scientists and engineers hired as associate professors who have been promoted to professors are summarized in Table 4b. Among the 119 assistant professors hired (30 women, 89 men) between 1996 and 2006 in the College of Engineering, five male and one female engineer have been promoted to professor. The College of Science hired 64 assistant professors during this same time period (20 women, 44 men). Seven male scientists (15%) hired as assistant professors have been promoted to professor. None of the women in the College of Science who were hired as assistant professors in this time frame have been promoted to professor.

Table 4b presents time in rank for faculty hired as associate professors. During 1996-2006 the College of Engineering hired 7 women and 46 men at the associate professor rank. Among those hired as associate professors in the College of Engineering, 10 males (22%) and 1 female (14%) have been promoted to the rank of professor after three to eight years in the associate professor rank. The College of Science hired 6 women and 14 men at the associate professor rank in that time frame. Among those hired, five males (33%) and two females (33%) have been promoted to professor after spending 3 to 11 years in the rank of associate professor.

Time at Institution by Gender

Table 5 shows average years at Virginia Tech for tenure-track faculty in the Colleges of Science and Engineering by rank and gender, as well as for the university as a whole. The average length of service at Virginia Tech for male professors in engineering is 13.3 years versus women professors who have on average 6.3 years. In science, the average years of service for male professors is 18 years versus women who have on average 9.1 years. University wide, male professors have been at Virginia Tech about 15.6 years versus females who have 10 years. Not surprisingly, these data show that women are relatively recent additions to the faculty ranks in engineering and science. These averages have changed little over the past four years.

Attrition

Table 6 summarizes the number of voluntary non-retirement departures by rank and gender for the College of Science and the College of Engineering from 1997-2007. The proportion of women leaving is significantly higher than for men (see also Table 3).

Leadership Positions

Table 7 summarizes the number of women faculty in various administrative and leadership positions in each college since the inception of the Advance grant. Data for the 2003-04, 2004-05, 2005-06, 2006-07, and 2007-08 academic years are presented for comparison. Leadership positions include administrative positions, professorships, and membership on promotion and tenure committees.

Women in Administrative Positions

Of the eight academic deans at Virginia Tech, two (Agriculture and Life Sciences and Liberal Arts and Human Sciences) are women. In addition, the Dean of Libraries is a woman. Nine (36%) of the 25 associate deans in the academic colleges are women, plus one of two associate deans in the Graduate School (50%). Only 7 of the 62 (11%) academic department heads are women; four of the seven women heads are in the College of Liberal Arts and Human Sciences. In fall of 2008, Virginia Tech will have its first female department head in the College of Engineering when a woman becomes head of the Computer Science Department. The College of Business will also gain a female department head this fall in the Department of Management. Women are also scarce in senior-level leadership positions at the university. The most senior positions (president, provost, and vice president) are held primarily by men; 3 of 14 (21%) executive administrators are women. Three women (21%) are directors of university-level research centers.

Professorships

Table 7 also presents data on the gender of endowed professors or eminent scholars at the college and university level at Virginia Tech. Endowed professorships at Virginia Tech

are a fairly recent phenomenon, dating back to the first capital campaign in the mid-1980s. Prior to that the university had established a rank for the most distinguished faculty using state funds; these were called University Distinguished Professors (UDP). UDP appointments are restricted to no more than 1% of the full-time faculty, and they remain the most prestigious faculty appointment for outstanding researchers. The Alumni Distinguished Professor (ADP) is also a coveted university-wide appointment which recognizes those whose contributions have been especially strong in teaching and service, although the selected faculty also have very substantial research records. Unlike the University Distinguished Professorships, the ADP appointments are endowed by donations from alumni. They are currently being awarded for a ten-year period. Both types of distinguished professor appointments are made on the basis of a call for nominations university-wide; a university-level committee makes recommendations for appointments to the provost and president. One of 14 (7%) UDPs is female; 3 of 10 (30%) ADPs are female. All four of these women are in the College of Liberal Arts and Human Sciences.

Faculty members selected for an endowed professorship or chair position receive a stipend and sometimes a small operating account. The amount of the stipend varies greatly, based in part on the value of the endowment and other factors. Typically these appointments are for life, although a number are rotating or renewable term appointments. Virtually all of the current endowed professors and chairs hold the rank of professor. Recommendations for appointment are typically made by a department or college honorifics committee, approved by the dean, and submitted to the Board of Visitors for ratification.

Professorships are often restricted to a particular specialty, department, or college, depending on the donor's intent. The number of endowed professors varies greatly by college, depending on the capacity of donors associated with private giving to the college and the historical success of the deans in attracting such gifts. Given the distribution of women by rank at Virginia Tech, particularly in science and engineering, it is no surprise that women are not well represented among either UDPs, ADPs, or eminent scholars from these two colleges. There are currently 9 women at the professor rank in science and seven in engineering, and many of these have only recently been promoted to professor.

Of the 122 eminent scholars at the university, only three (2%) are women. This number has remained consistently between 2% - 4% since the 2003-2004 academic year. Two of these women are in the College of Liberal Arts and Human Sciences and one is in the College of Science.

Promotion and Tenure Committees

The University Promotion and Tenure Committee includes nine faculty representatives (one from each college and one at-large) and the eight academic college deans. The Provost serves as non-voting chair. During the 2003-04 and 2004-05 cycles and again in 2006-07, the majority of the faculty representatives (5 of 9) were women. In 2007-08, 3

of 9 faculty representatives were women. Two of the eight academic deans who sit on the committee are female, as shown in Table 7.

Review for promotion and tenure (P&T) takes place at three levels at Virginia Tech. Department-level committee structures vary in size and membership. In small departments, it is common for all tenured associate and full professors to participate. In larger departments, committee members may be elected, or some elected and some appointed. Table 8 shows the gender composition of department and college promotion and tenure committees in the Colleges of Science and Engineering.

During the 2007-08 academic year, 7 of the 11 departments in the College of Engineering had at least 1 woman member on the P&T committee. In the College of Science, five departments reviewed faculty members for promotion and tenure during the 2006-07 academic year. Four of those five departments included women members on their P&T committee.

College-level promotion and tenure committees also vary in their membership. The College of Engineering P&T committee includes faculty representatives and all department heads, with a total of 25 members during 2007-08, only one of whom was a woman. During the 2007-08 academic year, the College of Science had an eight-member P&T committee with three women members.

Recruitment and Start-up Packages

Significant attention has been given to the recruitment of women in the College of Engineering and College of Science over the past five years.

Recruitment

Table 9 summarizes the number and percent of new hires in the College of Engineering and the College of Science from fall 1997 to fall 2007. Recruitment of female scientists and engineers has improved somewhat following the inception of the Advance grant in 2003, although both the number and percent of women hired has remained consistent over the past two academic years. Thirty-three percent (33%) of assistant professors and 17% of the associate professors hired during the 2006-07 academic year in the College of Engineering were women. Thirty-six percent (36%) of the assistant professors and zero percent (0%) of hires at the associate professor rank in the College of Science were female in this most recent year. Five men and no women in the College of Engineering and two men and no women in the College of Science were hired at the rank of professor.

Start-up Packages of Newly Hired Science and Engineering Faculty by Gender

Virginia Tech has a complete database of start-up packages for new faculty hired in the 2006-07 academic year. Due to the timing of annual report submittal and the academic hiring calendar, this is the most recent data available for inclusion at this time. Because

the number of faculty (especially women faculty) hired in any single department in a given year is small, specific data are not reported here in order to protect individual confidentiality. A more rigorous analysis of possible gender effects controlling for academic discipline (at the department level) may require aggregating data across several years.

During the 2006-07 academic year, the Virginia Tech College of Engineering provided an average start-up package (exclusive of salary) for female assistant professors of $204,208 while the average startup package for male assistant professors was $216,523. The value of start-up packages for assistant professors in the College of Engineering ranged from a low of $65,104 in Industrial and Systems Engineering to a high of $339,977 in Electrical and Computer Engineering. No women were hired at the associate or professor level in the College of Engineering in 2006-07. The average start-up package for male associate professors was $220,401, and values ranged from $150,710 to $258,419. The average start-up package for males hired at the rank of professor was $115,447, and values ranged from $71,000 to $142,145.

The College of Science provided an average start-up package for female assistant professors of $174,114 during 2006-07 and the comparable figure for male assistant professors is $112,256 with a range of $23,500 in statistics to $369,283 in biological sciences. No women were hired at the associate or professor level in the College of Science in 2006-07. At the associate professor level, the average start-up package for male new hires was $402,500. The average start-up package for males hired at the rank of professor was $416,500.

Salary

A complete salary equity study was conducted during summer 2007 and is included with this annual report. Multiple regression techniques following the *Paychecks* methodology were used to assess the impact of gender on faculty salaries across the university. The following factors were considered: gender, minority status, academic unit, academic rank category, time in rank (the length of time the faculty member held that particular rank), tenure status, US citizenship status, time at Virginia Tech (length of time since the faculty member's most recent hire date), and experience prior to joining Virginia Tech (calculated as the length of time between the date a faculty member was awarded his/her highest degree and that faculty member's most recent hire date at Virginia Tech). Gender effects on faculty salaries did not reach statistical significance despite several different statistical approaches to test gender as an individual effect and in interaction with other key factors like rank.