

ADVANCE INSTITUTIONAL TRANSFORMATION AT KANSAS STATE UNIVERSITY

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Abstract — *Kansas State University (K-State) recently received an Institutional Transformation Award from the National Science Foundation ADVANCE Program. These awards are intended to promote cultural change that will increase the participation of women in engineering and science departments, colleges, and the workforce. K-State's ADVANCE award will build upon the success of its ongoing programs that foster the careers of women students and faculty members. Our ADVANCE Project includes the Colleges of Agriculture, Arts & Sciences, Engineering, and Veterinary Medicine. The deans of these colleges serve as project principal investigators and senior personnel. Project initiatives will occur in individual departments, college-wide, and across colleges. We will discuss the climate at K-State as it pertains to gender at the beginning of the project. We also will provide information about the proposed project initiatives and the mechanisms by which we hope to effect the desired changes.*

Index Terms — *ADVANCE, faculty, Institutional Transformation, women.*

INTRODUCTION

The Kansas State University (K-State) National Science Foundation (NSF)-funded ADVANCE Project aims to create a transformed institution that purposefully attracts, retains, supports, and advances women in the disciplines of science, engineering, and mathematics (SEM). Our project features a variety of initiatives, which include both “top-down” and “bottom-up” approaches, encompassing project-, college- and department-level programs. The project will involve four colleges whose faculties include the majority of women scientists and engineers on campus, and in which women are the most underrepresented. These colleges are Agriculture, Arts & Sciences, Engineering, and Veterinary Medicine.

The goals of our ADVANCE Project are:

- To promote change in existing departmental policies, procedures, and practices, and develop new ones as needed, to foster a gender-equitable climate within partner departments;
- To expand and enhance departmental recruitment practices to attract more women applicants and ensure that candidates are not subject to subtle bias in the search and hiring process;

- To implement effective programs that foster the careers of faculty and encourage their retention through tenure and promotion; and
- To propagate the successes achieved in partner departments to all engineering and science departments.

Our project was created by the authors (Principal Investigators (PIs) on K-State's ADVANCE Institutional Transformation Project) in conjunction with Dr. Suzanne Franks, former director of the K-State Women in Engineering and Science Program, and with the deans of the four participating colleges. Input from SEM faculty members also was solicited and incorporated into the design of project initiatives.

INSTITUTIONAL CONTEXT AT THE BEGINNING OF THE PROJECT

University-Wide Efforts to Promote Gender Equity

Over the last fifteen years, K-State has taken a proactive approach in identifying and addressing equity issues and has sent a clear signal that it is serious about creating an inclusive community. The following section describes several university-wide initiatives undertaken since 1990.

The **Equity Issues Committee** was appointed by the Provost in 1999 to study faculty salaries and other equity issues. Its charge included (1) determining whether statistically significant inequities existed in salary between male and female faculty members or between minority and non-minority faculty members and (2) identifying other equity issues of concern. The Committee's initial study of FY1999 faculty salaries identified small, but statistically significant, differences in male and female faculty salaries across the university. Analysis of salary by rank showed that the largest differences existed at the full professor level. Department heads were asked to review achievement records of women faculty whose salaries were below a specified level for each rank, make an appropriate salary adjustment, or explain why adjustment was not warranted. Adjustments were made in a number of cases and a follow-up study of FY2001 faculty salaries did not find a statistically significant difference in male and female faculty salaries. The Committee made several recommendations that included (1) conducting the faculty salary study on a bi-annual basis; (2) administering a university-wide survey to determine areas of

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concern regarding equity issues; (3) sharing survey results with members of appropriate campus units; and (4) incorporating actions taken by central and departmental administrators to address issues of concern as part of their annual and five-year evaluations. Additionally, the Committee developed an equity issues toolkit, which is available online and contains institutional data, assessment tools, and resource materials [1].

A university-wide **retention study** in 1999 also revealed gender inequities in retention as a problem to be addressed. The status of all individuals in yearly cohorts, six academic years after the year of hire, was determined for faculty hired in 1989-90 through 1995-96. The percentage of male faculty tenured in each cohort was relatively constant at ~65%; female faculty tenured in each cohort fluctuated widely, between 33% and 79%. Similar trends to those seen at the university level were observed in the 27 SEM departments, with an overall retention rate since 1989 of 59% for men, 50% for women. This study identified the need for strategies that provide an improved climate for women faculty leading to increased retention.

The **Task Force on Women Faculty** was appointed in 1997 by the Provost to consider issues facing K-State women faculty. It studied the achievements of women faculty, gathered gender-based strategic action plans from other institutions, and made recommendations to the Provost [2]. These included encouraging the establishment of mentoring programs; naming a Senior Advisor for Gender Issues (the second author of this paper); and holding deans and department heads responsible for increasing gender diversity. As a result, deans and department heads are now directed to assist new faculty members in establishing mentoring relationships with senior colleagues, and each college has a diversity committee, charged with addressing gender issues and faculty diversification.

The **Provost's Lecture Series** was established in 1995 as a high-profile lecture series featuring nationally known speakers and campus experts to address topics of importance in higher education. One to two lectures each year are devoted to addressing gender or other diversity issues. It provides a lively campus forum for discussion and debate on issues that impact the academic environment. Recent participants have included Claude Steele, Sylvia Hurtado, and Virginia Valian, author of Why So Slow? The Advancement of Women [3].

The **Office of Diversity and Dual Career Development** (DDCD) was established in 1990 in response to two specific needs: (1) retention of faculty, staff, and students of color; and (2) the challenges implicit in dual-career hires. This unit reports directly to the Provost and works with all sectors of the University to enhance racial/cultural diversity and create a campus environment that fosters both academic excellence and appreciation of diversity. Its director works collaboratively with deans and department/unit heads to facilitate dual-career hires. Partners of faculty members seeking employment are provided with

information, referrals, networking and advocacy. DDCD also was instrumental in developing K-State's partnership with the Dow Chemical Company. The Dow Diversity Partnership established the Dow Multicultural Resource Center at K-State; endowed the director's position for the K-State Multicultural Engineering Program (described below); funded a summer science and engineering workshop at K-State for high-school girls; and provides scholarships for students of color.

Programs for Women and Minorities in SEM

K-State recognizes that the SEM fields present unique challenges for members of underrepresented groups. Several programs exist to foster their inclusion and success.

The **K-State Mentoring Program for Women and Minorities in the Sciences and Engineering** [4] was established in 1993 with funds from the Sloan Foundation; full funding was assumed by the university in 1999. Its purpose is to enhance the success and thus improve the retention of female and minority faculty members in SEM disciplines. This is a broad-based program to match tenure-track women and/or minority faculty with a mentor in their discipline and provide flexible funding to support initiation of research. To date, 45 individuals in five K-State colleges have received awards (9 minority women, 5 minority men); of these, 29 have secured extramural funding; 20 have received tenure; and four women were promoted to full professor within 10 years of hire. Participants have used the funding to 'jump-start' their research; as support for travel, training courses, or field research; and to purchase equipment. Participants also report that the mentoring component of the program has given them access to expertise in proposal preparation, information on departmental politics and procedures, tips on setting up and maintaining a research program, and advice on managing instructional and service responsibilities. The participants attribute both their individual and the program's success to the customized mentoring relationships ('one size does not fit all') and flexible funding guidelines.

The **Women in Engineering and Science Program** (WESP) was established in 1999 as a joint program between the College of Engineering and the College of Arts and Sciences, with support from the Office of the Provost. Its mission is to promote the recruitment and retention of women students in engineering and science. It has done so by creating a series of outreach, recruitment, and retention initiatives for girls and women from middle school through graduate school. These include *Women Mentoring Women*, a peer mentoring program for first-year women in engineering; membership in *MentorNet*, a national e-mentoring program for undergraduate and graduate women in SEM; and the *WESP Distinguished Lecture Series*, which features speakers who provide women students with mentoring and career advice. Funding for these programs is provided by grants and corporate sponsors.

The **Multicultural Engineering Program** was created by the College of Engineering in 1977 to assist with recruitment and retention of students of color in engineering. It provides a support base to foster academic and social growth and assists students as they transition into professional life upon graduation. It offers scholarships for high-achieving students; academic, career, and personal advising; tutoring; mentoring; and an engineering orientation class. These activities, along with the efforts of the multicultural professional engineering societies to establish student branches, have contributed to an increase in the percentage of undergraduate students of color in engineering.

Specific Barriers to Women's Advancement at K-State

In the fall of 2001, women faculty members comprised 22% of 1011 tenure-track and tenured full-time faculty. With the exception of Veterinary Medicine, the percentage of women faculty in all SEM departments was then and still is significantly lower than the university-wide percentage. In fall 2001, there were only 10 full-time women full professors, 6 in the College of Agriculture and 4 in the College of Arts and Sciences. There were 2 women full professors in engineering; however, both held full-time central administrative appointments and did not have active appointments in the college. Of the 27 SEM department heads, only one was female. Women of color comprised only 2.1% of full-time SEM faculty.

In preparing the ADVANCE Institutional Transformation proposal, the principal investigators met with department heads and faculty from the six partner departments to discuss possible short-term and long-term initiatives. These meetings, along with informal surveys of faculty and the outcomes of previous university-wide diversity initiatives (described above), led to identification of three primary barriers to women's advancement in SEM fields at K-State. These are:

- *Lack of effective recruitment*

Effective recruiting results in an increase both in the number of women in the applicant pool and in the acceptance rate for offers extended to women. Search committees must be proactive and learn to recognize and compensate for any unconscious biases they have as they review candidate credentials and select candidates to interview. Achieving a critical mass of women faculty and department chairs in SEM is necessary to alter the culture and environment that women experience [5]-[7]. Efforts to increase the numbers of women in SEM at higher ranks are integrally related to our ability to effectively recruit them initially [3,7]. Recruitment emerged as a particularly challenging issue in the Colleges of Engineering and Veterinary Medicine, and dual-career issues have arisen in all four colleges.

- *Exclusion from networks*

Typically, male faculty members enjoy a collegial, professional, and informal mentoring network of their peers that facilitates their advancement and creates a sense of

community. In contrast, because the numbers of women faculty in SEM are so low, similar female networks are not available to them. In addition, women are often excluded from or have difficulty entering existing departmental and college networks, which are predominantly male. This difficulty persists even for women who have achieved tenure [7]-[9]. The low numbers of women faculty in SEM at all ranks, and their exclusion from informal networks, reduce opportunities for women to receive mentoring and advice on university and departmental politics, information about wise choices for service commitments, and the most effective means of establishing a national reputation [10,11]. Each of these issues arose in conversations with K-State faculty and department heads. Failure to include women in existing departmental networks hampers their individual success and reduces the possible contributions of those women to the success of their departments. As a result, everyone loses.

- *Subtle biases*

Achieving a critical mass of women faculty and administrators is necessary but not sufficient for institutional transformation. As Kitts states: "*Subtle limitations seem to arise from the fact that the architecture of academic science was created by males for a male constituency. The 'rules' are based on a 'male model' of 'doing' science that requires an absolute time commitment from the participator and an aggressively competitive attitude towards peers...[Women] want to participate in and contribute to science, but because science is framed within a system that [women] did not help to build, it does not take [women's] beliefs, wants, and needs into consideration. [Women] are forced to work in an atmosphere that is incompatible with [their] psyche[s] or get out*" [12].

Such unconscious biases constitute a barrier to the entry of women into SEM fields, play a continuing role even when the numbers of women increase, and contribute to the higher rates of attrition for women SEM faculty. An informal, anonymous survey of tenured women faculty at K-State revealed the existence of numerous subtle biases: gender-biased student evaluations of teaching; a mismatch in the value systems of men and women faculty; disproportionate service burdens; and perceptions of male colleagues that women lack ability and/or commitment. Taken together, these factors result in a more difficult road to tenure and a longer time in rank for women at the associate professor level [3,6,8,12].

These three barriers contribute to an asymmetrically gendered effect on the success of women and men. This is not unique to K-State, but has been documented elsewhere [3]. This asymmetry functions to advantage men and disadvantage women. In the words of Valian, "*like interest on capital, advantages accrue; like interest on debt, disadvantages accrue*" [3]. Institutional transformation requires a comprehensive effort to create awareness of this asymmetry, actively work to negate its effects, and change policies, procedures and practices to remove it entirely.

INITIATING THE ADVANCE PROJECT

Our ADVANCE Institutional Transformation proposal was submitted in September 2002, and we were notified conditionally of our award in April 2003. Following a period of negotiation, clarification, and budget revision, NSF made the award formally in September 2003, with a project start date of October 1, 2003. In between the time that the proposal was submitted and the funds were awarded, several personnel changes involving project principal investigators and senior personnel had occurred. This required us to create a new project administrative structure with a new lead PI for the first project year and to bring in a new co-PI and replace one of the senior personnel. An Executive Committee, composed of the authors (a faculty member in Biology and the Assistant Provost, respectively), together with the Deans of Arts & Sciences, Continuing Education, Engineering, and Veterinary Medicine, and the Associate Director of the Agricultural Experiment Station, directs the project. The Steering Committee, consisting of three of the PIs, the Project Coordinator, representatives from each of the four participating colleges, and the WESP Director, oversees and facilitates project activities.

We began the project with a campus-wide presentation on ADVANCE by Alice Hogan, NSF Program Director for ADVANCE, as part of the Provost's Lecture Series in October 2003. The necessary next steps were hiring a project coordinator and identifying and renovating office space for the project. The latter effort was greatly facilitated by individuals in the K-State central administration.

The PI and the project coordinator then undertook a series of conversations about the project and its initiatives across campus. These included visits to each partner department and with the department heads and unit leaders within each participating college.

We have begun to design the ADVANCE Project website, which will contain background information and the current status of each of the project initiatives. We also will include the resources and tools that we develop as part of this project and will provide links to resources available on websites of other ADVANCE institutions.

PROJECT-WIDE INITIATIVES

Equity Action Workshops

We are inviting nationally recognized experts to campus to lead workshops on equity issues relevant to our project initiatives for college-level administrators and faculty. Workshops are open to interested individuals from across campus. These workshops will help departments address issues of gender-equitable recruiting strategies; dual-career situations; subtle biases affecting the evaluation of women students and faculty members; explicit and implicit messages sent by departmental websites and recruiting literature; and strategic planning to address both planned and

unplanned faculty absences. Thus far, Drs. Virginia Valian (Hunter College) and Cynthia Burack (Ohio State University) have conducted workshops. In the second year of the project Dr. Burack will conduct a follow-up workshop, and K-State personnel will lead additional workshops on other topics.

Women's Resources Website

We are creating a central, highly visible, and easily accessible website that contains a collection of K-State and community resources of particular interest to women. Innovative aspects of this website will include: integration of personal and professional resources in one location; ability to search for information on specific needs; and a compilation of individual strategies to negotiate work-life balance issues. This website also will showcase women faculty, their research interests, and their accomplishments. K-State's Vice Provost for Academic Services and Technology has pledged the support of central information technology staff to assist with creation and maintenance of this website. We are collaborating with the K-State President's Commission on the Status of Women to develop the content of the website.

Academic Career Exploration

The *Academic Career Exploration* (ACE) program will focus on women of color early in their undergraduate careers to acquaint them with the entire range of faculty responsibilities and to encourage them to consider graduate school and careers in academia. First- and second-year female SEM students from underrepresented groups will (1) learn about research being conducted at K-State, tour laboratories, practice using equipment, and meet one-on-one or in small groups with faculty members in various disciplines; (2) hear about development of course materials and other aspects of teaching from faculty members who have received teaching awards; and (3) receive information and coaching on summer research opportunities and on best practices for preparing applications and soliciting letters of reference. The ACE program is scheduled to begin in the second year of the project.

K-State Mentoring Program for Tenured SEM Women

The needs of tenured women faculty members often go unrecognized locally and by national funding agencies. This project will create a mentoring program for tenured women to facilitate their transition to senior-level positions. This program will operate in a manner similar to the successful, existing mentoring program for women and minority faculty in the sciences and engineering described above. The first call for proposals was issued in spring 2004 for awards that will begin in fall 2004.

ADVANCE Distinguished Lecture Series

We have created a unique seminar series that allows tenure-track women faculty to identify a leader (male or female) in

their research area to invite to campus in each year of the project. It offers women the chance to showcase their research programs to disciplinary leaders who may in the future serve as external evaluators of their grant proposals, journal articles, or tenure packages. The campus visits will feature one-on-one time for the faculty member with the speaker, and when possible, visits by the speaker to the faculty member's classes. The woman faculty member and her dean will jointly issue invitations to the seminar, and the presentation will be advertised widely across campus. Departments will have the option of including these presentations as a part of an existing annual seminar series. Evening dinners with the speaker will provide an additional opportunity to build relationships and will enhance the potential for collaboration and mentoring.

We believe that participation in this initiative will accelerate the development of networks for our new faculty members; include women in decision-making roles; and create links between women faculty and disciplinary leaders.

The first call for proposals for the lecture series was issued in spring 2004; seminars will take place in spring, summer, and fall 2004. The series was inaugurated with a presentation by Dr. Nancy Hopkins of the Massachusetts Institute of Technology (MIT) on MIT's response to its 1999 report on the status of women in science [10].

COLLEGE INITIATIVES

Each participating college will use discretionary funding provided by the project to create initiatives to benefit women faculty in its SEM departments. These include efforts to improve recruitment, professional development, retention, mentoring, and entry into administrative roles.

Parallel Paths is a group mentoring program for faculty in the College of Veterinary Medicine (CVM) designed to foster the development of junior faculty and sustain the productivity of senior faculty. Each group will consist of four to seven junior faculty and three senior faculty facilitators. Groups will meet monthly to focus on achieving success via paths that are parallel but specific for each faculty member. Topics will include teaching strategies or techniques, learning styles, grant proposal writing, graduate student and resident training, achieving a balanced academic life, leadership skills, politics of higher education, and the status and future of veterinary medicine. Funds allocated to Parallel Paths will be used to support faculty development workshops, conference fees, and travel. The overall goal of Parallel Paths is to help the CVM create an environment that helps faculty members be successful in their teaching, research, clinical, and service roles.

The College of Arts & Sciences is developing an *Administrative Shadowing Program* to provide women faculty members with experience in an administrative role and help them gain awareness of administrative issues. Women early in their post-tenure careers will be paired with unit heads or college administrators to carry out a particular

project, to learn about department and college processes, to observe how decisions are made, and to reflect on the leadership roles of administrators. The mentor will include the faculty member in the day-to-day conduct of the office and meet with her to discuss issues. Women who participate in the program will receive summer salary support.

Research Enhancement Visits is a program the College of Engineering will use to encourage interaction between women faculty members and disciplinary leaders in their fields. Funds will be provided for women faculty members to travel to other institutions, national laboratories, or companies for the purpose of initiating collaboration, learning a new research technique, or interacting with relevant industry leaders. A second program that will be implemented by Engineering is *Recruiting to Expand Applicant Pools*. This initiative will provide competitive funding awards to departments to create novel recruiting strategies. For example, proposals might request funding to send the department head or faculty members on recruiting trips to institutions that produce significant numbers of women Ph.D.s in their discipline. Another possible use of such funds could be as an incentive in dual-career situations. This program can stimulate departments to be more proactive in their recruiting practices.

The College of Agriculture will offer small awards that can be used for a variety of purposes to enhance the career development of women in the college. These awards might be used as seed grants, for travel funds, or for conference expenses. The college is purposely leaving the uses of the funds up to women faculty members in order to let the women themselves identify the areas of highest need.

DEPARTMENTAL INITIATIVES

Departmental Policy Review

Frequently, it is true that a department's own policies and procedures create the culture that exists for its faculty. The six partner departments working with us on this project are Animal Science & Industry, Biological & Agricultural Engineering, Biology, Chemical Engineering, Diagnostic Medicine & Pathobiology, and Geology. Faculty members from these departments will initiate self-studies of their websites, recruitment literature and methods, and faculty evaluation documents to identify and address subtle biases that may be present. These efforts will be informed by the Equity Action Workshops, and facilitated and evaluated by the Steering Committee. A novel aspect of this initiative is the strategic planning that departments will undertake to address faculty leave issues. These issues include sabbaticals, leaves without pay, and unplanned leaves that result from illness (of the individual, his or her partner, or a family member), pregnancy, childcare, and elder care. These are often handled on an *ad hoc* basis and are rarely acknowledged as issues that departments should address proactively. When policies are explicit and transparent, they reduce the stress on individual faculty members as well as

the department as a whole by facilitating accommodation of both planned and unplanned absences. An established policy will ensure that the burden of increased duties is distributed fairly, and will include appropriate elements of reciprocity.

Departmental Websites

In this day and age, the first look that potential students and faculty candidates get at a department of interest is often through the departmental website. This website may create the impression that the department in question is an inclusive community for teaching and research or present a picture of an uninviting environment that does not acknowledge diversity and that has the potential to exclude women. Faculty members from our partner departments will review and revise their departmental websites. We have engaged an outside consultant who will evaluate these efforts and provide feedback.

Career MAPS

Career Milestones for Academic Personal Success (Career MAPS) is envisioned as a “hire-to-retire” program. Deans and department heads will work with women faculty members of all ranks to develop long-term career plans. Together, they will set goals and milestones; identify the accomplishments needed for tenure and promotion; plan the timing of sabbatical leave; discuss active participation in professional societies, development of leadership skills, careful selection of service assignments; and consider other discipline-specific issues. The Executive and Steering Committees have developed a template and prepared guidelines for these Career MAPS. Each college and department will subsequently customize these for its own use. Initially, this program will involve tenure-track women faculty, but departments will be encouraged to expand the Career MAPS program to all faculty members. This program can readily be introduced into any college or department, whether they are partners in the project or not. The template will be ready for distribution and use in the fall of 2004.

ASSESSMENT, REVIEW, AND DISSEMINATION

We are working closely with our project evaluation team to develop assessment tools and carefully evaluate each of our initiatives. We will gather valuable insight and feedback from these evaluations that we will use to refine, modify, and improve our efforts.

We will share among our partner departments what each of them learns and develops, and we will disseminate what we learn with other departments and colleges at K-State and with other institutions across the nation.

CONCLUSION

Our ADVANCE project team has a vision of an academic world in which women’s concerns, interests, and contributions are recognized and valued, and where women and men work together in equal partnerships for the benefit

of society. We anticipate that the efforts initiated in the four participating colleges and in the six partner departments within these colleges will pave the way for improvements in the climate and culture for women faculty across the University.

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