NDSU ADVANCE FORWARD: Transforming a Gendered Institution

1. NDSU's Current Situation. Since 1999, North Dakota State University (NDSU) has been undergoing dramatic institutional transformation, spearheaded by President Joseph Chapman. One of his five campus themes, "It's about people" underlies his administration's core values. His public statements echo this theme consistently as demonstrated in this year's State of the University address: "The recruitment, retention, and advancement of women and underrepresented groups in all fields are important if we are to be the national research university of our aspirations" (NDSU, 2007). To help implement such goals, Chapman created a campus-wide Diversity Council in 2001, co-chaired by the Provost/Vice President of Academic Affairs and the Director for Equity and Diversity (recently retitled Executive Director and Chief Diversity Officer). The Council administered a campus climate survey (2003) and used the survey data to develop a strategic plan (2005) for a more inclusive community. This plan expects all campus units to include diversity components in their annual reports, which are reviewed by strategic plan assessment teams for accomplishments and promising practices. FORWARD (Focus on Resources for Women's Advancement, Recruitment/Retention), an informal group, also has laid the groundwork for change through a series of studies and initiatives on barriers women face at NDSU.

In addition, as part of NDSU's transformation, Chapman successfully challenged faculty and administrative leaders to move the campus from a Carnegie-classified Research Intensive University to a Research Extensive University. This challenge resulted in new doctoral programs that advanced research and extramural funding. NDSU's efforts have resulted in record enrollment for the eighth year in a row, and the number of graduate students has nearly doubled in eight years. Research expenditures have increased 108% (to over $100 million/year) in only six years, significantly outpacing the national average. According to the NSF data on academic research and development expenditures, NDSU is one of the fastest growing research universities in the Northern Great Plains region (2005). Moreover, increased external funding has led to the creation of several large research entities on campus including the Center for High Performance Computing and the Center for Nanoscale Science and Engineering.

THE CHRONICLE
of Higher Education

At North Dakota State, Women are Few and Far Between

Why does one university seem so behind the times?

Despite these positive developments over the last eight years, NDSU struggles with a chilly climate and with its efforts to recruit and retain women faculty, including women of color and women with disabilities. The *Chronicle of Higher Education's* November 2, 2007, feature story documented these problems. While the article points out some serious challenges that NDSU faces, it has shaped much conversation on campus; in the past month, it has been the subject of ongoing focus group research with campus women and five formal on-campus discussions, the most recent of which, sponsored by the Women's Studies program, received lengthy coverage in the local news media.

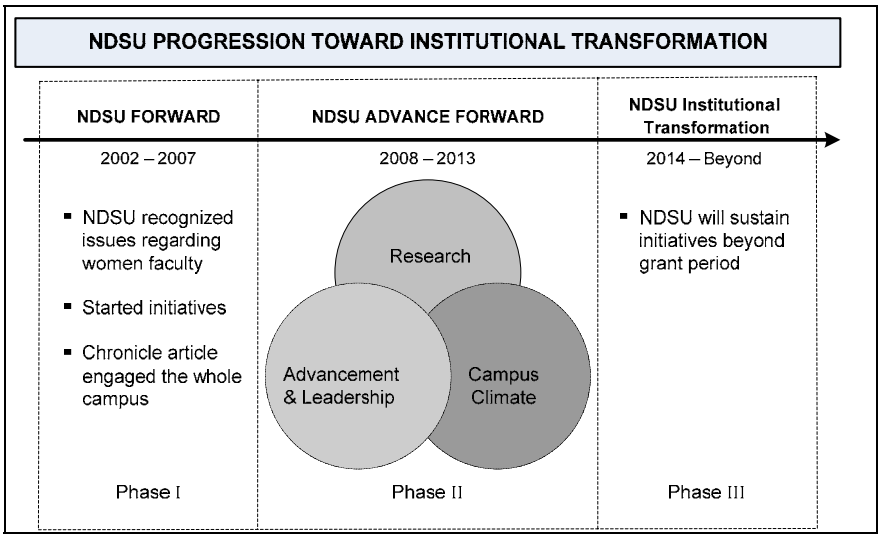
Gender equity issues are not only the center of campus discussion but are providing renewed impetus for swift response and permanent change. Chapman's commitment to equity and diversity, and FORWARD's efforts, coupled with the *Chronicle* discussions, make NDSU poised for change. We find ourselves, in some ways, similar to Harvard University. While Harvard is obviously a different institution from our university in prestige, endowment, and location, we too find ourselves faced with a public gender-related situation. Harvard resolved its situation publicly by taking immediate action, and in similar manner NDSU plans to build on the publicity about gender issues to increase awareness and implement meaningful change at all levels of the university.

In the context of this institutional growth and change, FORWARD's effort to improve campus climate for gender diversity and equity provides the underpinning of NDSU's institutional transformation—especially in science, technology, engineering, mathematics, and social science disciplines funded by NSF (hereafter referred collectively as STEM). We envision institutional transformation under this ADVANCE FORWARD proposal like that described by Eckel et al. (1998, p. 3; see also Smith-Doerr, 2004)—a transformation that: "(1) alters the culture of the institution by changing select, underlying assumptions and institutional behaviors, processes, and products; (2) is deep and pervasive, affecting the whole institution; (3) is intentional; and (4) occurs over time."

The NSF ADVANCE Institutional Transformation grant will be a powerful tool in building an NDSU that equally respects and values women's and men's contributions to the academy and one that addresses the ways in which our societal views of gender have created current inequities and barriers for women. In summary, the preliminary work done under FORWARD and the *Chronicle* article have involved faculty leaders and given increased importance to the efforts of the President and Provost. NDSU is truly in a unique position to achieve significant institutional change and

to document the successes of that change for a national audience. In the following sections, we describe NDSU and how it is prepared for change, the theoretical model and conceptual framework for our proposal, the challenges we face, and our proposed goals. Then, we describe our proposal in detail, outline our outcomes and evaluation strategies, and provide our management plan. Throughout this document, we advance an ambitious, yet achievable plan to transform NDSU. Figure 1 presents our conceptual framework for ADVANCE FORWARD.

Figure 1. ADVANCE FORWARD Conceptual Framework



1.1. NDSU—an Institution Poised for Transition. As described, NDSU has made a remarkable transformation in many areas, and needs to mirror that transformation with regard to equity and diversity. NDSU has a solid foundation from which to launch and sustain positive change in these areas. NDSU's home, Fargo, is a metropolitan area often listed among the nation's best places to live. The National Civic League named Fargo an All-American City in 2000. According to the Chamber of Commerce, Fargo-Moorhead, a community of 185,000 people residing in Cass and Clay counties, topped the list of US cities ranked on 200 indicators about environment, health, and quality of life compiled in the 2007 Urban Environment report (Earth Day Network). The Chamber also notes that Fargo-Moorhead's environment and quality schools helped place it 69th among *Money* magazine's 100 "Best Places to Live" (2006). In 2007, *Self* magazine named Fargo-Moorhead the nation's 10th healthiest urban area for women.

NDSU, a public land grant university, serves more than 12,500 undergraduate and graduate students, covering the full range of NSF divisions. The University comprises eight colleges including the graduate college and grants bachelor's degrees (BS and BA), graduate degrees (MS, MA, PhD, and EdD), as well as specialist and professional degrees (PharmD, DMA, DNP, MBA).

Despite the recent *Chronicle* article, NDSU has begun to make significant changes regarding gender issues on campus. We have set the stage and are ready for comprehensive institutional transformation. In his State of the University speech on October 4, Chapman noted, "In student, faculty, and staff recruitment and retention efforts, we strive to promote a more diverse university," and he pointed to FORWARD as an important group in this effort. The President has announced the creation of 32 new faculty positions (17 of which are in STEM departments). These new positions will be advertised as open rank rather than only as assistant professor positions to increase the opportunity to hire more women and people of color at advanced rank. The President anticipates creating a similar number of new positions next year as well.

The Provost, Craig Schnell, also has been instrumental in several key changes: an automatic tenure clock stop for family leave; continued review and upgrade of childcare availability on campus; and the promotion of existing dual career hiring policies. In an effort to increase clarity and fairness, he recently completed a review of college and department promotion, tenure, and evaluation standards to increase the specificity of promotion guidelines with regard to the quality/quantity of research, teaching, and service. The Provost also supported two women faculty to attend the National Institutes of Health conference, National Leadership Workshop on Mentoring Women in Biomedical Careers, at the invitation and sponsorship of the NIH. The Executive Director of the Office for Equity and Diversity (OED) has been elevated to a member of the President's Cabinet. The Diversity Council, in keeping with NDSU's Strategic Plan for Diversity, will conduct another climate survey in 2008-2009. NDSU's efforts over the past five years demonstrate the types of change that will occur on a more remarkable level with an NSF ADVANCE grant.

1.2 Theoretical Basis and Background for ADVANCE FORWARD. The inception and metamorphosis of the self-initiated FORWARD group provides an example of the institutional change Sassen describes in *Territory, Authority, Rights* (2006). She suggests that transformation begins in "informal, or not yet formalized, institutional arrangements and practices in the analysis of change" (12). The precursor to the FORWARD group was the "ADVANCE project group" established in 2002 by the Dean of Engineering & Architecture for the purpose of writing a proposal to NSF's ADVANCE program. The Dean convened an informal group of faculty and administrators committed to the recruitment/retention and advancement of STEM women faculty. While preparing the grant proposal, we realized that the scope of the problem was larger than expected. We also recognized the need to examine existing data, gather experiential information from women faculty, and identify useful but previously uncollected data related to the issue. We explored the literature in gender and organizational life as a resource for developing our first ADVANCE proposal, and at that time we adopted FORWARD as our name. The FORWARD group included the Provost, the deans of Science and Math and Engineering and Architecture, faculty from each college, including two women department chairs, the Director of Women's Studies, the Director for Equity and Diversity, and staff from the Office of the Vice President for Research, Creative Activity, and Technology Transfer (RCATT). While our proposal was not funded (2005), we wanted to sustain the momentum and the sense of community we had gained while collaborating on the project. Vowing to continue our work, we developed a strategic plan. Under the auspices of FORWARD, we continued working to offer data-driven solutions to institutional challenges that limit NDSU's ability to recruit, retain, and advance women faculty.

Research on the nature of organizations (Acker, 2000; Connell, 1987; Ely & Meyerson, 2000; Kolb et al., 1998; Ramsey & Letherby, 2006) provides convincing evidence about the seemingly neutral organizational structures and obscure mechanisms that systematically limit women and other groups. Acker (1992, 251) finds that organizations are gendered to the extent that they pattern "advantage and disadvantage, exploitation and control, action and emotion, meaning and identity" in gendered terms: "male and female, masculine and feminine." Acknowledging and understanding gendered patterns are essential to understanding the historical and persistent ways women have been disadvantaged in university STEM departments (Etzkowitz et al., 2000; Hess, 1997; MIT, 1999; Nelson & Rogers, 2004; Rossiter, 1982, 1995; Summers, 2005). Such institutional patterns are complicated further by the intersection of gender and race, which doubly jeopardizes advancement for women of color in the sciences (Collins, 2000).

On NDSU's campus, women faculty are often, in Sassen's language, "authorized yet unrecognized" members of the university community (2006, 295-6). Women faculty are formally brought into the institution—hired with degrees and ostensibly authorized as faculty members—but they lack the voice and influence within the institution to stimulate change and address their needs in formally recognized ways. For example, the largest group of women faculty at NDSU is assistant professors, while the largest group of faculty overall is male full professors—creating both a gender and hierarchical imbalance that renders women less recognized in the institutional setting. Change can occur, however, because women faculty are legitimate participants in the institution, enabling them to work within that context even if it is in spaces that are largely unstructured and without direct access to institutional influence. Currently, NDSU's self-initiated FORWARD is one such unstructured space where women from across campus have come together and worked toward change. FORWARD members have set into motion changes that have had an impact on the broader institutional climate and laid the foundation for an authorized and recognized space for change. Some accomplishments:

1) Conducted research on the effects of institutional policies and practices:

- Initiated systematic institutional data collection, with assistance of OED, and analysis related to gender on the NSF's 12 indicators.
- Conducted research studies on gender and current/recently resigned NDSU faculty (2002, 2007).
- Planned, wrote, and submitted an NSF ADVANCE proposal in 2005.

2) Worked to improve the campus climate for women:

- Held a teleconference for NDSU deans and department chairs/heads on gender-related issues on campus. Three NSF-funded ADVANCE institutions participated.
- Collaborated with the OED to develop a comprehensive faculty extended leave policy and formalize family leave procedures—a work in progress.
- Held weekly meetings between the President and key members of the FORWARD group (at his request, Fall 2007).
- Recommended training for all search committee chairs.

3) Worked to improve institutional structure:

- Conducted a childcare needs assessment study (2004) resulting in recent administrative provision of additional childcare facilities for faculty and staff parents.
- Launched a pilot lactation facility and collaborated with Facilities Management to install diaper changing stations in every building on campus.
- Created a project website (http://www.ndsu.edu/FORWARD).

These activities resulted in the adaptation or creation of several institutional practices. The two Deans in the FORWARD group meet regularly with the women faculty in their respective colleges and are now providing extra monies to bring an additional female from among the top 10 job applicants for on-campus interviews. Since 2006, the Provost has required search committee chair training and this year began to require a diverse candidate pool before moving forward with interviews. The OED will begin systematic online exit surveys and interviews with an outside consultant of all faculty leaving the institution.

FORWARD's work and the attention it has brought to issues important to women faculty at NDSU correlates with the change that has occurred in the percentage of women tenured faculty. Between 2002 and 2007, the percentage of tenured women faculty has risen from 4.5% to 8.9% and may be attributed in part to FORWARD's work. Although this percentage of tenured women placed NDSU the second lowest in AAUP's 2006 Faculty Gender Equity Indicators study, several STEM departments (computer science, mathematics and engineering departments—industrial and manufacturing, agricultural and biosystems) report a higher percentage of women faculty than the national average (Gibbons, 2006; Nelson, 2005).

These data document the beginning of change. The next step is to recognize women faculty within the university and transform their informal, unstructured spaces, such as FORWARD, into institutionally recognized spaces. The President's appointment of a FORWARD representative to his Diversity Council represents one way this process is already beginning. Through the process of changing an unstructured space into a structured one, FORWARD will advance transformation of the campus as a whole (Katz et al., 1980). Our approach to this transformation requires multiple interventions that: (1) study the effects of institutional policies, practices, and programs; (2) improve the campus climate, removing the attitudes and behaviors that create barriers to women's advancement; and (3) offer women faculty knowledge, skills, and resources for success in teaching, research, and leadership.

1.3 The Status of Women Faculty at NDSU. Despite these significant changes, NDSU faces five specific challenges in its efforts to recruit and support women faculty, especially in the STEM disciplines:

Challenge # 1: Chilly climate for women faculty including women of color and women with disabilities. Williams' (2004) findings that systematic gender bias and stereotyping create an unwelcome climate for women, describes the climate for some at NDSU. For example, the 2003 Diversity Council's campus climate survey revealed that among the 242 faculty who responded to the web-based survey, 81.7% of the men indicated they were comfortable or very comfortable with the climate in their departments compared to 70.3% of the women. Although only a small number of faculty reported harassment based on sex (n=19), women constituted 73.7% (n=14) of those reports. And, finally, when asked to indicate if NDSU addresses issues of sex (gender), 64.6% of the men agreed or strongly agreed, but only 33.3% of the women did.

In 2002, four FORWARD faculty gathered evidence of barriers to women's retention in a survey of current and recently resigned faculty. Forty-nine male/female pairs matched by rank and discipline responded to questions about the university as a place to work. Results identified areas associated with greater attrition of women faculty: stress based on subtle discrimination, work-related stress, stress due to time pressure, lack of personal time, and difficulties in departmental communication.

In one part of a two-pronged FORWARD study conducted in fall 2007, consultant, One Degree, Inc., interviewed a sample of women and men who had left NDSU (n=20). In the second part, an online survey targeted other faculty who had left NDSU (respondents=46) as well as current faculty (respondents=247). The online survey of those who left revealed that women reported among their top five reasons for leaving: receiving better job offers and subtle or overt discrimination (both 52.9%), conflict with a direct supervisor and conflict within the department (both 29.4%), and other reasons, including climate-oriented explanations such as isolation and being ignored. The responses from current faculty revealed that women are less satisfied with the climate than men (concerns included communication, feeling dissimilar from others in the department and college, feeling a lack of unity/cohesion among faculty in the college, lack of collaboration opportunities). Current women faculty rated the climate significantly lower than men (p-value = 0.028). They also felt significantly more stressed in balancing their work and family life than men (p-value = 0.024). Thus, the data FORWARD has collected over the past five years indicate significant differences in the climate that men and women experience.

The Collaborative On Academic Careers in Higher Education (COACHE) survey, administered to NDSU assistant professors in 2006, reveals that people of color are significantly more dissatisfied than whites at NDSU, in part due to isolation. There only are 31 tenured men of color (27 in STEM) and 3 tenured women of color (all in STEM), contributing to their even greater sense of isolation and vulnerability.

Challenge #2: Too few women in STEM applicant pools. There have been only modest gains in the numbers of women faculty at NDSU since 2001. Table 1 shows that in 2005-06, we interviewed a greater percentage of women faculty applicants than were in the initial pool, and generally hired at a higher percentage. Based on NSF's 2005 report *Doctorates Awarded to Women by Field of Study & Year of Doctorate* (http://www.nsf.gov/statistics/nsf07305/), we still do not approach hiring the percentage of women available in the pipeline.

Table 1. Percentage of women applicants, interviewees and hires by college, 2005-2006

NDSU Women Applicants	% Applicants	% Interviewed	% Hired
All Searches	17.2%	28.7%	21.9%
Science & Math	15.9%	28.6%	14.3%
Engineering & Architecture	8.0%	18.8%	16.7%
Pharmacy, Nursing & Allied Sciences	14.3%	33.3%	-
Agriculture, Food Systems & Nat'l	19.3%	27.3%	20.0%
Arts, Humanities and Social Sciences	53.7%	50.0%	100%
Human Development & Education	100.0%	100.0%	100%

Challenge #3: Retention of women faculty is low in STEM disciplines and overall. Table 2 indicates a dramatic imbalance of tenured men to women, with the total percentage of tenured men in 2007-08 at 57% (n=272), and the total percentage of tenured women at 8.8% (n=42). In STEM, the imbalance is greater, with tenured men at 58.9% and tenured women at 4.3%. This imbalance of men to women faculty creates a gendered institution and leaves some women feeling isolated and vulnerable.

Table 2. Number (percentage) of STEM and total faculty who are tenured by gender

Academic Year	STEM Faculty			ALL Faculty		
	Tenured		Total (Tenured & Tenure-Track)	Tenured		Total (Tenured & Tenure-Track)
	Women	Men		Women	Men	
1992-93	4 (1.6%)	175 (68.1%)	257	25 (5.4%)	270 (58.1%)	465
2000-01	6 (2.2%)	183 (65.8%)	278	25 (5.7%)	249 (56.5%)	441
2004-05	9 (3.2%)	177 (62.3%)	284	30 (6.2%)	253 (52.3%)	484
2006-07	12 (4.4%)	164 (60.7%)	270	38 (8.1%)	245 (52.1%)	470
2007-08	12 (4.3%)	166 (58.9%)	282	42 (8.8%)	272 (57.0%)	477

The online portion of the FORWARD 2007 survey of current faculty revealed that women at the institution are significantly less satisfied than their male counterparts in three of six areas: climate, nature of work, and balance of career and family. There were no significant differences between STEM and non-STEM women.

Furthermore, the data in Table 3 suggest two things: 1) although the numbers of women have increased at the assistant level, NDSU has not consistently retained these women; 2) NDSU is poised to promote a large number of women (STEM and all fields) in the next five years if we can reverse our poor retention rate.

Table 3. Number of women faculty

Women Faculty	1992-93			2000-01			2007-08		
	Assistant	Associate	Full	Assistant	Associate	Full	Assistant	Associate	Full
STEM	10	2	2	16	3	3	32	8	4
ALL	41	18	7	50	18	7	72	30	9

Challenge #4: Limited numbers of women advance to full professor in the STEM disciplines and overall. Despite 15 years of increasing success in hiring women as assistant professors, the number of women full professors has not increased significantly. For example, between 1992-93 and 2000-01, eight years during which we might

expect a cohort of women to have become tenured and promoted, there were still only 18 associates and 7 full professors, representing no change at the upper ranks. Presently, only 2% of women faculty at NDSU are full professors, a total of 9, up from 1.5% in 1992. Male full professors are the largest group on campus, 31.2% of total faculty. Four of the women full professors are in STEM (1.5% of STEM faculty) as opposed to 90 full professor STEM men (33.3%). The over-representation of male faculty at the highest ranks reinforces the concept of a gendered institution and contributes to differences in the perception of climate for women faculty and for women faculty of color.

In the 2007 FORWARD survey of current faculty, women associate professors were the least satisfied group on campus, having the lowest means for all groups in 17 of 28 response categories and responses lower than their male associate professor counterparts in 23 of 28 indicators. Women associate professors' responses showed particular dissatisfaction with levels of stress, communication, and opportunities for research and advancement. The dissatisfaction and lack of opportunity women feel once they become associate professors may contribute to their high rate of attrition: 25% as opposed to 5% for men.

Challenge #5: Few women in academic leadership roles. While women faculty at NDSU serve on and chair major university committees, of 8 academic deans only1 is a woman. In STEM colleges, only 1 of 28 department chairs/heads is a woman, and of the 5 STEM deans none are women. There are only 2 women chairs/heads outside of STEM (Apparel, Design, Facility and Hospitality Management, and Nursing), and national searches for department chairs/heads have not resulted in any new women chairs/heads. The FORWARD 2007 online survey of current faculty reveals that women feel they have less opportunity to advance than men (p-value = 0.001). The limited number of women in major administrative positions has huge implications because there are few female role models for women faculty interested in career advancement. This lack may contribute to a climate in which talented women faculty leave because they do not see potential for career growth at NDSU.

2. Proposed Goals for Institutional Transformation at NDSU.

Although challenges in 1.3 are significant, they are not insurmountable. NDSU has begun change and has the institutional will and collective desire to move forward. NSF's funding of ADVANCE FORWARD will accelerate the University's efforts. To meet these challenges, FORWARD has developed a plan that draws on best practices from contextually appropriate NSF ADVANCE grants and recent research. Based on the specific challenges NDSU faces, and researched understanding of our current situation, we offer the following goals to guide our programmatic activities and research:

- **Goal 1—Improve Climate.** Improve the climate across the campus and narrow the gap between men's and women's perceptions of the campus climate.
- **Goal 2—Enhance Recruitment.** Employ targeted recruiting strategies to recruit women, women of color, and women with disabilities to STEM departments.
- **Goal 3—Increase Retention.** Retain more women in STEM departments through their probationary period and the promotion/tenure process.
- **Goal 4—Promote and Advance Women.** Support women associate professors in the STEM disciplines as they move to full professor, and hire advanced women in STEM fields to build a critical mass of senior women in STEM departments.
- **Goal 5—Create Leadership Opportunities.** Promote/hire women faculty into academic leadership positions.

3. ADVANCE FORWARD: Strategies for Institutional Transformation of NDSU

3.1 From Unstructured to Structured Spaces: A Proposal for Institutional Change. Creating an authorized and recognized space, with clear links to formal university structures, is necessary before FORWARD can do more than undertake campus projects that raise awareness of women's issues. The authority of a structured space is necessary to stimulate gender-focused institutional transformation. Such a space is a mechanism through which women faculty gain the recognition necessary to promote climate change and increase participation in organizational life. According to resource dependency theory, organizations respond to entities in their environment that control critical resources (Pfeffer & Salancik, 1978). Materialist, cultural, and institutional forces shape organizational behavior. Therefore, in addition to links to other formal university structures, FORWARD's transition into a structured space requires an economic presence to legitimize its work. The economic presence of an NSF investment, coupled with a very strong investment by NDSU, will provide FORWARD the influence and voice needed within the University to bring about the organizational changes promised in this proposal.

3.2. NDSU's ADVANCE FORWARD Organization. The proposed project, ADVANCE FORWARD, is organized under a FORWARD Center. Like WISELI, the University of Wisconsin's NSF funded ADVANCE Center, ADVANCE FORWARD will bring campus visibility to gender equity issues and will ensure, by offering coordinated program

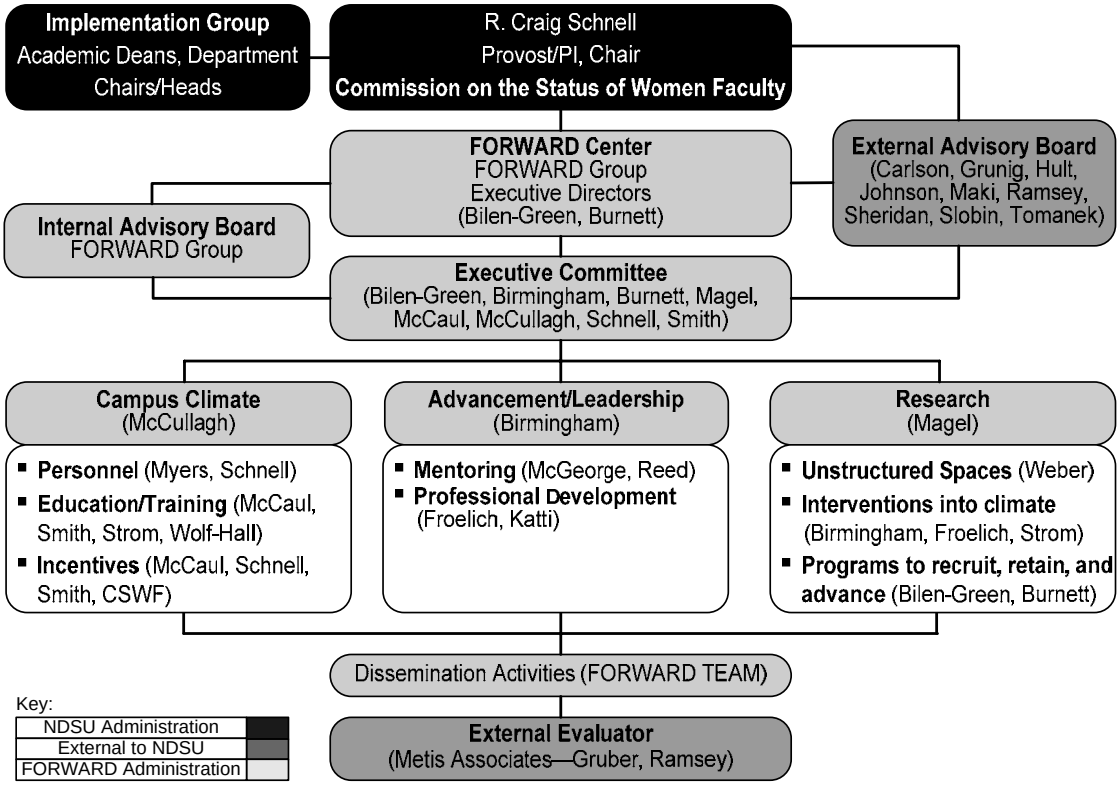
administration, that project personnel, faculty, and staff can anticipate responsive and continuing activities to advance women faculty. Co-PI's, Dr. Canan Bilen-Green and Dr. Ann Burnett, will lead the project, and with the Provost/PI, Schnell, and FORWARD Center staff, will coordinate, implement, monitor, and report ADVANCE FORWARD activities. FORWARD scholars, women doctoral candidates in STEM disciplines, will assist in the work of each division while gaining research and administrative skills.

To support and institutionalize the activities of ADVANCE FORWARD, the Provost will create the Commission on the Status of Women Faculty (CSWF). This Commission's membership will include: the Provost (Commission's chair), the Chief Diversity Officer, three representatives from FORWARD, and women faculty or Allies representing each college. This Commission allows FORWARD to influence NDSU's institutional transformation effort and help NDSU achieve equitable representation of women in faculty and administrative ranks. The Commission's activities supporting transformation include: salary review, workload review (including student loads, teaching loads, and service commitments), and resource analysis by gender and rank. Policy work for the Commission includes: studying accessibility issues for women faculty with disabilities, developing a comprehensive extended family leave policy, and formalizing leave procedures. This Commission will meet monthly and twice yearly with the President.

In addition, the Provost, with input from the CSWF, will offer gender equity awards to units doing outstanding work in engaging their members in equitable practices, policies, and activities. Tying such rewards to achieving diversity and improving climate offers real encouragement to units that take on this work. A similar university, Purdue, effectively ties such success with diversity to departmental rewards within the Engineering College. The Commission is the hub through which initiatives and developments from the FORWARD Center are launched into the university structure through the Implementation Group consisting of deans and chairs/heads. Thus, it forms a link among FORWARD, central administration, and faculty women, assuring a space that is both recognized and authorized.

The programs shown in Figure 2., and described in the remainder of the proposal, reflect the FORWARD group's understanding of effective interventions employed in previous NSF ADVANCE funded programs, but add to them a research agenda that explores how these interventions transform the gendered university and disrupt the complex intersections of gender, race, and national origin that are especially salient in STEM disciplines. Although this proposal requests funding for programs to support women in STEM disciplines, the President and Provost are committed to transforming the entire campus. They have pledged funding for equivalent programs for women in non-STEM academic units.

Figure 2. Organizational chart for FORWARD and programs



3.2.1 Campus Climate Division. This division focuses on the institution and its leaders. It implements educational programs for deans and chairs/heads to enlist their leadership in the transformation of the campus climate. A recent study found that when researchers compared the three most common programs for achieving diversity, (1) establishing organizational responsibility for diversity, (2) moderating managerial bias through training and feedback, and (3) reducing the social isolation of women and minority workers, that the most effective strategy was to establish organizational responsibility (Kalev et al., 2006). Consequently, although our plan incorporates and studies the interactions of all three interventions, it focuses most centrally upon the responsibility of every unit for setting goals, working toward a diverse faculty and a supportive, collegial environment, and tying institutional rewards to success in these areas. The following programmatic components are designed to improve the campus climate:

1. Personnel

Add a full-time position in the OED (with 50% funded by the grant for work with STEM disciplines and 50% by the institution) to conduct search committee training, assist search committees in targeted recruiting efforts with such programs as NSF Louis Stokes Alliances for Minority Participation and Alliances for Graduate Education in the Professoriate, and work with search committee members to help them identify and use effective search practices.

2. Advancement/Training

- Conduct required workshops for deans, chairs/heads consisting of a ½ day session on issues of gender awareness conducted by external experts and a ½ day session on the Training Our Campuses Against Racism (TOCAR) program (which will address issues of race that emerged from the COACHE study). The gender awareness workshop will mirror the training offered by the NDSU Anti-Racism Team (http://www.ndsu.edu/diversity/antiracismteam.html). The two FORWARD deans will spearhead involvement, but training will extend beyond the STEM disciplines to include all academic administrators.
- Require gender equity awareness workshops for all new faculty within the first three years of their hire (with the expectation that all current faculty will participate as well). According to Sanders (2003), gender equity workshops must utilize data from the institution, incorporate action steps, and include follow-up. Initially, our External Advisory Board (EAB) members will assist with training. Ultimately, FORWARD team members and FORWARD Allies (see below) who have gender and training expertise will assume responsibility for the training to assure continuation beyond the grant cycle.
- Train FORWARD Allies, senior male faculty, who can have an effect on creating a positive climate in their departments and colleges. Allies are essential to affect positive change in the "dominant male academic" culture. Just like NDSU's Safe Zone training (http://mu.ndsu.edu/safezone/), which helps heterosexual allies develop skills and strategies to become effective advocates for change, our Allies program identifies tenured men who are supportive of women colleagues and provides training for their effective advocacy.
- Host a campus kick-off conference, with the President and Provost, inviting the campus community's participation. This conference describes the grant programs, communicates institutional goals, shares research and campus data, and emphasizes that institutional transformation requires everyone's commitment. The conference also will provide departments with tools to assess their current climate, and offer workshops for colleges and units to discuss and set goals, and develop plans. These activities will draw on the expertise of our EAB, a group of nationally recognized women who will help the institution foster conversations on gender and climate.
- Educate the FORWARD group about Native American cultures and issues by facilitating meetings between FORWARD members and Native American educators and students at tribal colleges who participate in the NDSU Nurturing American Tribal Undergraduate Research and Education program (NATURE, http://www.ndepscor.nodak.edu/programs/TribalCollegesPrograms.htm).

3. Incentives

- Award up to 2 yearly climate and gender equity competitive research grants to interdisciplinary research teams on issues of gender and the academy. The goal is to engage the university in research on gender, develop interdisciplinary research teams, and demonstrate the value of research on gender in a gendered institution.
- Offer small grants to help STEM departments hire an outside consultant to assist with climate, mediation, communication, or strategic planning issues. The goal is to help individual departments with acknowledged challenges. Selection will be based upon need and readiness, and will require a 50/50 fund match and a proposal that includes a reporting mechanism. Over the five years of the ADVANCE grant, every eligible department will be able to employ a consultant for strategic planning for equity and diversity.

3.2.2 Advancement and Leadership Division. This division is responsible for planning and delivering a cohesive portfolio for developing and advancing women STEM faculty and includes a mentoring program, research support,

and leadership training opportunities designed to help women making the move between ranks: from assistant to associate, from associate to full. We will offer the following programs:

1. Mentoring

- **Mid-Career Mentoring.** Decrease isolation and encourage tenured women to seek external funding, collaborate, create networks, and gain access to administrators. Women apply for funds to create peer, mid-career mentoring teams, which may be interdisciplinary, that will meet informally once a month. The program also includes twice-yearly formal meetings involving tenured women and academic administrators. Such meetings with administrators support continued reverse mentoring in which women share experiences and ideas with administrators.
- **Cohort mentoring.** Offer formal mentoring in cohorts, as well as additional activities, to ensure women faculty have opportunities to acquire the knowledge and skills for successful teaching, research, and leadership. Because women at NDSU perceive the climate differently from men, our program proposes same-gender mentoring groups that invite all incoming female faculty to participate in a single cohort through their third year review. Although the program focuses its attention on mentoring women in STEM disciplines, women faculty from across campus also will be included in order to provide enough mentors and networking possibilities for new women faculty. These additional women will be fully funded by the Provost. Our cohort mentoring program includes the following:

  Networking. Develop mentoring networks composed of 4-5 new faculty and 2 senior women. Studies have found that women strongly prefer women as their mentors (Bickel & Clark, 2000; Wunsch, 1994), and same gender relationships provide women with more psychosocial support (Ragins & McFarlin, 1990). Senior women apply to be mentor-team leaders and receive financial compensation for professional development. The most successful mentoring programs offer monetary support, demonstration of institutional commitment, and recognition as tangible rewards (Mark et al, 2000; Zachary, 2000).

  Mentor training. Train faculty mentors and those mentored concerning issues, roles, opportunities, and goal setting. Research suggests that good mentoring is enhanced when the parties involved have training (Hall & Sandler, 1983; Zachary, 2000) and contracts outlining roles and responsibilities.

  Activities. Host two annual workshops that bring all cohort members together with senior women faculty (in addition to their mentors), campus administrators, FORWARD Allies, and outside experts who also will deliver open addresses to the campus. Institutional training opportunities will focus on more practical issues: grants and research funding, administering a research program, strategies for new teachers, and being effective (but not exploited) members of committees. Activities also will include networking opportunities with both campus administrators and women community leaders such as the Women's Network of the Red River Valley, Fargo-Moorhead Area Women's Foundation, and women faculty in the Tri-College Consortium. In all activities, the goal is to help women faculty with issues of balance in work/life and in teaching, research, and service as well as providing connections with the broader community—especially important for single women faculty.

  Reverse mentoring. Engage administrators and FORWARD Allies in activities, events, announcements, and high-profile program activities. This interaction provides a space for reverse mentoring and ongoing professional development to help administrators, especially chairs/heads, learn about the specific and sometimes different needs of women faculty—leading to the adoption of policies and practices that will support women faculty.

2. Professional Development

- **Course Release Grants.** Offer a one-semester, one-time teaching release for up to five STEM women annually to enhance their research productivity. The course release program is open to female assistant professors who have had a positive third year review, and to female associate professors within two years of applying for promotion.
- **Leap Grants.** Offer competitive Leap Grants, each up to $30,000, to advance women by enhancing their research productivity. The program will be open to STEM female assistant professors who have had a positive third year review, and to female associate professors within two years of applying for promotion. A total of 3-6 grants per year will be awarded. Matching or additional funds have been dedicated by the Vice President of RCATT to augment these awards where needed. We expect these Leap Grants, combined with support of an RCATT grant writer dedicated to STEM faculty, will enable STEM women faculty to acquire external funding.
- **Leadership Development Grants.** Provide funds to send at least two women each year for national leadership training of their choice. Such training could reach 75% of tenured women in STEM disciplines over the five years of the grant. In addition, ADVANCE FORWARD will provide funding for tenured women in STEM disciplines to attend NDSU's HR Frontline Leadership course.
- **Travel Grants.** Offer professional development grants to offset costs of meeting with mentors from outside NDSU to undertake research or build long-term professional relationships. These grants will supplement

professional development funds available in the organization. We will place high priority on those activities that NDSU's institutional travel funds do not cover.

3.2.3 Research Division. This division will study program effectiveness and answer research questions that evolve from three related factors: (1) the ADVANCE FORWARD programs and activities we have designed to help meet our institution's challenges; (2) the specific exigencies of NDSU's situation (recent growth, changing expectations, and location); (3) the analytical framework through which we hope to approach change. This approach assures that we attend to local problems and issues, but extends our findings to explain other situations and help other institutions facing similar challenges develop useful and innovative programs. Our areas of research are as follows:

1. **Unstructured spaces.** How do unstructured spaces become authorized and recognized within an institution, and what mechanisms offer marginalized groups greater recognition within institutional settings? By exploring the ways in which women and faculty of color have employed unstructured spaces to gain authorization and recognition within the institution, we can better understand the opportunities for and constraints upon change that this model has allowed at NDSU.
2. **Interventions into climate.**

- **Allies program.** How does using an Allies program involve the campus more widely in the processes of institutional transformation? What role do supportive members of the majority group play in changing a gendered institution, and how does training increase the effectiveness of such Allies?
- **Administrator training.** How does ongoing training for department chairs/heads combine with the reverse mentoring that occurs when these administrators regularly interact in structured settings with women faculty? What is the role of reverse mentoring in achieving institutional transformation?
- **Role of "critical mass" in climate.** Is there a relationship between more women academic administrators and the effectiveness of recruitment and retention of women faculty? How/why do women academic administrators help recruit and retain women, if in fact they do? Do units need a "critical mass" of women/women of color before widespread effective recruitment and retention are possible, and if so, is this process speeded by the presence of women examining the organizational and individual factors associated with NDSU, our research will identify those that might have gender-based advantages and lead to gender-linked dissatisfaction. Previous work academic administrators?

3. **Programs to recruit, retain and advance women faculty.**

- **Mentoring.** Since NDSU women faculty report significantly more dissatisfaction than men in present mentoring programs (2007), do our same gender mentoring cohorts solve these problems? And, if women begin to report more satisfaction with mentoring, does that lead to better recruitment, retention, and promotion of women faculty? If so, what mechanisms in our program lead to success?
- **Gender and productivity.** How do we understand and respond to gender-based advantages in research processes in this institution? Women faculty at NDSU report less satisfaction with research-related issues: time for research, support for research endeavors, and expectations for research (2007). By indicates possible gendered differences in productivity in the short term and over an entire career (Cole & Cole, 1973; Reskin & Hargens, 1979; Slobin et al., 2002; Zuckerman, 1970).
- **Leadership.** Are leadership programs effective in encouraging women faculty to undertake academic leadership roles? If so, how/why?

The research division will work closely with our external evaluator to ensure that we design appropriate instruments and collect the necessary data to answer these research questions.

4. Outcomes and Evaluation.

In this section, we identify expected outcomes of the ADVANCE FORWARD plan and describe our data collection strategies and our external evaluator's qualifications.

4.1 Outcomes. Each of our proposal's objectives has a corresponding quantifiable outcome, which will help us develop appropriate indicators of success.

- **Outcome 1—Climate Change.** Find no significant difference in the perception of the climate between genders or between under-represented groups and the majority, while improving the overall climate.
- **Outcome 2—Recruitment.** Standardize expectations to minimally mirror pipelines from doctoral programs before a search may move forward in order to assure that all pools include a representative number of women and women from under-represented groups.
- **Outcome 3—Retention**. Retain 90% of women through the tenure decision; increase numbers of associate women in STEM disciplines from 8 to 24 by the end of the grant period (tripling present numbers).

- **Outcome 4—Promotion.** Increase number of STEM women full professors from 4 to 10 in the next five years.
- **Outcome 5—Leadership.** Promote or hire women in at least 2 more dean positions (for a total of 3 women Deans) over the next 5 years; increase women chairs/heads in the STEM disciplines to 5 of 28.

4.2 Evaluation. ADVANCE FORWARD will retain Metis Associates, a national research and consulting firm, to serve as the external evaluator of this initiative. During its 30-year history Metis has worked on a wide range of educational program evaluations including NSF-funded Math Science Partnerships and Local Systemic Change projects, as well as U.S. Department of Education FIPSE programs, and a program funded by the NIH. Dr. Lori Gerstein Ramsey, Senior Research Associate, will direct the evaluation, supported by Research Associate Joelle Gruber. More detailed information about Metis' recent applicable work experience is provided in the attached letter of support and resumes.

4.2.1 Evaluation Plan. In collaboration with Metis, we have conceptualized a comprehensive evaluation design that will include formative (process) and summative (outcome) components. The evaluation will employ multiple measures combining the collection of qualitative and quantitative data to assist in assessing the impact of the ADVANCE FORWARD initiative on participants and the institution. Metis will ensure that all data collection activities will be conducted and reported in accord with generally accepted standards for ethical conduct, and will keep confidential all documentation (e.g., focus group, interviews and survey data), sharing only anonymous information with FORWARD staff. To support the evaluation and ensure its relevance and responsiveness to key stakeholders, Metis will work closely with FORWARD's research division, headed by statistician, Dr. Rhonda Magel, and the EAB to inform the evaluation throughout the duration of the project.

Formative evaluation will track the extent to which the process indicators are being met and inform the project's executive committee about the quality of implementation; identify problems needing immediate attention; and generate recommendations for program improvement. Formative evaluation data include: project documentation (e.g., professional development and dissemination, program meetings, agendas, institutional data), focus groups with participating female STEM faculty members and NDSU academic administrators, and individual interviews with the FORWARD group. Summative evaluation examines the extent to which the program meets desired outcomes for program participants. Metis and FORWARD will collect summative evaluation data from surveys and institutional data and will use multiple methods and measures to triangulate findings to increase the reliability and validity of results.

4.2.2 Instrument Development and Data Collection. During the project's first year, Metis/FORWARD will develop instruments in response to formative evaluation findings. Each data collection instrument will be developed to gather information that addresses the goals and objectives of the proposal. Because there is no universally appropriate research design, nor single accepted measure for any given variable, Metis/FORWARD will design research with a strong preference for multiple measures of independent and dependent variables combining both qualitative and quantitative data sources, self-report data, and direct empirical evidence (observations and recording). Since any single data source inevitably has both strengths and shortcomings, this approach will enable Metis/FORWARD to capitalize on the strength of multiple data sources. Information about each type of data collection method is provided below:

- **Observations** are valuable to the evaluation for the in-depth information they provide related to the quality and content of project-sponsored activities. Data gathered through observations provide rich qualitative information and inform the preparation of other instruments, including surveys. Metis will observe different project activities (e.g., professional development sessions, committee meetings) and document program activities using observation protocols developed in collaboration with the FORWARD group.
- **Interviews/Focus Groups** conducted with key stakeholders, including FORWARD program staff, NDSU administrators and STEM faculty participants, will elicit respondents' perspectives on how the initiative has impacted the climate of the university, female STEM faculty recruitment and retention, and the academic leadership opportunities for women at NDSU. In the first year, findings from the interviews and focus groups will identify salient variables and inform survey development.
- **Online Surveys** completed by participants in the spring of each program year will be disaggregated by gender and STEM/Non-STEM status. Metis will also administer a survey for deans and chairs/heads, and a programmatic survey for female STEM faculty participating in the specific programs provided by the grant. Following final agreement on the content of the surveys with the EAB, they will be placed online for electronic distribution to participants. The surveys will be structured around the objectives identified in the proposal and should not take longer than 30 minutes to complete. Data collected from the surveys will be used to inform FORWARD staff about the progress of the initiative, strengths and challenges of the program, as well as provide information on the university's progress during the initiative.

- **Document Reviews**, conducted annually, include professional development materials, program meeting minutes, FORWARD committee meeting minutes, memoranda, and dissemination documents. These documents provide information about project implementation and the extent of participation in and intensity of exposure to grant activities. The purpose of collecting document data is to highlight program activities, determine the extent to which the initiatives are meeting objectives, and provide information that informs the outcome analyses.
- **Analyses** of quantitative data will be conducted through a variety of methods. Because new initiatives often take several years to become institutionalized, and because more than one exposure to these initiatives is often necessary for them to have notable impacts on participants, we will analyze outcomes to determine whether those participants who remain in the program longer realize greater overall impact than those with less exposure (i.e., "dosage effect"). Metis/FORWARD will employ content analysis for qualitative data from interviews, observations, and site visits, summarizing emergent response categories. Where appropriate, Metis/FORWARD will employ qualitative data analysis software such as N-Vivo to organize, code, analyze, and summarize qualitative data. In order to form overall summaries and recommendations, Metis/FORWARD will triangulate data from both formative and summative sources. In addition, in order to "put a face" on the data and further articulate successes of the project, Metis/FORWARD will formulate abbreviated case studies of a subset of participants.

4.2.3 Timeline. During year 1, the evaluators will convene the evaluation team to identify annual indicators of success for each objective, set clear benchmarks, finalize instruments, and initiate processes for data gathering and analyses. Years 2 -5 will include revision of instruments as needed, additional data collection, and analysis activities.

4.2.4 Reporting. Formative reporting will occur at regular intervals each program year. Throughout the project period Metis will submit formative finding reports to the FORWARD group before each quarterly conference call. These reports provide summaries of evaluation activities, present initial findings, and include preliminary recommendations. Metis will prepare annual evaluation reports to meet NSF requirements. Annual reports include implementation data pertaining to the process and outcome data related to the impact of the program on participants and the campus climate. The reports include sufficient contextual information to give meaning to the evaluation and provide a firm foundation for conclusions and recommendations. These evaluation reports will be suitable for distribution to a broad audience, defining all technical terms within the context and focus of the evaluation. The reports will include documentation of procedures and methodologies; a presentation of quantifiable, descriptive, and analytic findings; illustrative graphics; and a narrative explanation of the data and interpretation of findings. All recommendations are derived from, and associated with, specific findings. In summary, Metis and FORWARD will collaborate to produce reports characterized by conciseness, logical development, well-defined terms, tabular or graphic representations, and relevant examples. Table 4 shows how project outcomes will be measured.

Table 4. Data sources for evaluating outcomes

Outcomes	Data Sources								
	Observations		Interviews/ Focus Groups			Surveys			Document Review
	Professional Development Sessions and other program activities	FORWARD Committee Meetings	ADVANCE FORWARD Program Staff	NDSU Administrators	STEM Female Program Participants	NDSU Administrators	Campus Climate Surveys of NDSU Faculty (disaggregated by gender and STEM/Non-STEM)	Program Surveys of participating faculty	Professional development and dissemination, program meetings, agendas, institutional data (e.g. numbers of men and women recruited, hired, promoted)
1. Climate	X	X	X	X	X	X	X	X	X
2. Recruitment	X	X	X	X	X	X		X	X
3. Retention	X	X	X	X	X	X	X	X	X
4. Promotion	X	X	X	X	X	X		X	X
5. Leadership	X	X	X	X	X	X	X	X	X

5. Managing ADVANCE FORWARD Activities.
The plan for managing ADVANCE FORWARD activities, programs, and research incorporates the varied expertise of FORWARD project leaders, NDSU administrators, and an exceptionally qualified External Advisory Board who will not only provide support as we implement a new program, but will share their expertise and experience in program development, research, and evaluation. This section outlines a management plan and addresses the sustainability of the project.

5.1 Management Structure. Figure 2 illustrates the ADVANCE FORWARD management structure: Schnell, Provost/Vice President of Academic Affairs, is the PI of this project. He understands that persistent, deep and significant institutional changes in higher education require vision, commitment, leadership and persistence. His role is to ensure that the University continues to commit necessary resources to meet project goals and sustain programs and positive results. In addition to the ongoing initiatives described in 2.1, the Provost has committed financial support for the ADVANCE FORWARD office and to fund equivalent programs for non-STEM women—thus assuring more uniform climate change and real transformation. Along with the Center's co-directors, the Provost will be a member of all three program divisions, the executive committee, the FORWARD group, and the CSWF, which he will lead.

The FORWARD directors, lead co-PI's Bilen-Green and Burnett, with the support of office staff, are responsible for organizing, coordinating, and assessing project efforts. They will prepare quarterly and annual reports to NSF, with input from and review by the Provost, Metis, the EAB, and FORWARD. The FORWARD group's membership will not change (see section 1.2), and FORWARD will continue to meet once a month to review progress, suggest any needed adjustments to the project, and provide support to the co-PI's. An executive committee, consisting of the Provost, the lead co-PI's, the two FORWARD deans, and division directors will meet regularly to coordinate activities, review program data, and make any adjustments needed in the project and programs.

CSWF, described in 3.1, will be linked through overlapping membership to an Implementation Group composed of NDSU academic administrators. This link recognizes that the academic administrators are the owners and leaders of change in their colleges and departments. They are responsible for improving the climate in their units; achieving gender equity in hiring, advancement, and distribution of resources; and modeling inclusive, responsive leadership. Positive evaluation of the academic administrators is supported by rewards for success in improving faculty gender equity in their units, because these administrators play a crucial role in ensuring that individual behaviors as well as campus-wide practices reflect institutional goals for equity and inclusiveness.

ADVANCE FORWARD will work collaboratively with its EAB. The members of this board have been selected because they are academic leaders, are currently involved in ADVANCE Institutional Transformation programs, or are engaged in research on multiple issues relating to gender and the STEM disciplines. They include Susan Carlson, Iowa State University; Larissa Grunig, Professor Emeritus, University of Maryland; Christine Hult, Utah State University; Jennifer Sheridan, University of Wisconsin; Peggy Johnson, Penn State University; Ruth Maki, Texas Tech University; Kathleen Slobin, Professor Emeritus, North Dakota State University; Debra Tomanek, Associate Professor of Molecular & Cellular Biology, University of Arizona. Because members of the EAB have experience implementing and assessing programs similar to ADVANCE FORWARD, its input will be especially valuable as the executive committee, FORWARD group, and Metis begin implementing programs, collecting data, and undertaking formative program evaluation. It will meet with FORWARD on campus yearly, and on occasion through teleconferencing facilities and/or NDSU's Group Decision Center's web-based virtual meeting space. Members of the EAB also will interact with administrators and faculty and serve as role models and even trainers when appropriate.

Finally, campus administrators have allocated an excellent physical space in a central location for the FORWARD Center's offices. ADVANCE FORWARD will be administratively housed at the NDSU Center for Science & Mathematics Education (CSME) (www.ndsu.edu/csme), where 1,500 feet of renovated space is committed for project space (see letter in supplementary documents).

5.2 Sustainability. The timeline for ADVANCE FORWARD programs is summarized in Table 5. Upon completion of NSF funding, the Provost will sustain and institutionalize the following ADVANCE FORWARD programs: the FORWARD Center (its space and facilities, and staff position), the CSWF, the Allies program, the Mentoring program, and the Competitive Research grant program (*through RCATT*). To assure continuation of the work begun with ADVANCE funding, NDSU gradually will begin assuming financial support of the climate, advancement, and leadership programs after the first three years of NSF funding. With the exception of the competitive research grant support, the President and Provost will – from the start – fund all of the proposed activities for non-STEM women faculty. Starting in Year 4, NDSU will fully fund the OED position originally created with 50% ADVANCE funds. For mentoring and diversity/gender awareness programs for faculty and chairs/heads, NDSU will employ a "train the

trainer" program; by Year 5, we will be able to conduct our own education and training, adapting the training to fit the needs of our institution. By the fifth year, RCATT will continue funding competitive research grant support, initially funded by the ADVANCE grant. Thus, by Year 6, NDSU will have incorporated most of the ADVANCE FORWARD program funding into its institutional budget. The gradual assumption of funding for the ADVANCE FORWARD project over the five-year period will make the transition to institutional funding a reasonable process and thus will ensure sustainability.

Table 5. Timeline for ADVANCE FORWARD Activities

	Year One			Year Two			Year Three			Year Four			Year Five		
Activities/deliverables	Su 08	Fa 08	Sp 09	Su 09	Fa 09	Sp 10	Su 10	Fa 10	Sp 11	Su 11	Fa 11	Sp 12	Su 12	Fa 12	Sp 13
Center Office															
Staff hire and start															
Program coordination															
Advisory board meetings	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Campus Climate															
Kick-off conference		O													
Administrator workshops		X	X		X	X		X	X		X	X		X	X
Faculty workshops		X	X		X	X		X	X		X	X		X	X
Allies training		X			X			X			X			X	
Gender equity award			X			X			X			X			X
Department climate grants		X			X			X			X			X	
Search committees															
Climate/equity grants		X			X			X			X			X	
Advancement/Leadership															
Mentoring cohorts															
Course release program															
Leap grant program		X			X			X			X			X	
Mid-career peer mentoring															
Leadership training		X			X			X			X			X	
Research															
Evaluation		R	R	R	R	R	R	R	R	R	R	R	R	R	R
External advisory board and evaluator visits		X			X			X			X			X	
Dissemination															

Key:

	Ongoing	X	Reoccurring activities	O	One time activity	R	Report to NSF

6. Project Outreach. NDSU will disseminate findings and achievements from its ADVANCE FORWARD project in four main ways:

- **Market** to campuses across the country the availability of FORWARD members to visit and make presentations about our project, its findings, and accomplishments. We will specifically target land grant universities and/or other institutions similar to NDSU. Such campus visits will be free to interested institutions, and the ADVANCE FORWARD grant will support travel for FORWARD members in Year 5.
- **Disseminate** our ADVANCE FORWARD project research findings at our disciplines' major national conferences as well as in refereed publications. The variety of disciplines represented by FORWARD members assures that our findings will be widely shared.

Conferences and proceedings. WEPAN; American Society of Engineering Education; National Women's Studies Association Conference; American Association for Higher Education Annual Convention; and National Communication Association among others.
Refereed publications. Gender and Education; Journal of Higher Education; National Women's Studies Association Journal; Social Forces; Journal of Engineering Education; Academy of Management ANNALS; and Journal of Women and Minorities in Sciences and Engineering among others.

- **Record** ADVANCE FORWARD training, meetings, activities, events, and notable changes in digital film format, creating yearly documentary evidence of the program's success on campus. A final ADVANCE FORWARD documentary will be available on the website and for DVD distribution.
- **Report** regularly to NSF ADVANCE, invite program directors to attend activities, and utilize our external advisory board to keep NSF ADVANCE aware of our activities and their results.
- **Post** regularly the research results to our FORWARD website, discuss findings with the FORWARD group and CSWF, and use mentoring teams to share activities in internal publications.

7. Best Practices from Prior NSF ADVANCE AWARDS and Why NDSU? In order to achieve intended institutional changes, NDSU's proposed strategies extend the work of previous ADVANCE awardees, tailor them to fit our campus, and conceptualize them as pivotal to transforming a gendered institution. Many previous awardees, such as the University of Wisconsin, have developed best practices for mentoring faculty, influencing campus environments through workshops for department chairs/heads, search committees, PTE committees, and monitoring program progress. These programs and practices will continue to offer a rich source of ideas as NDSU implements its program.

Although ADVANCE FORWARD adopts best practices from previously funded ADVANCE programs, it differs from these programs significantly in the framework that conceptualizes its research program. In addition to understanding what interventions work to disrupt the ways in which the gendered institution constrains women while enabling men, our research also will focus on how these interventions work to disrupt the mechanisms of the gendered university. FORWARD hypothesizes that these mechanisms go beyond policies alone. This issue has been noted by Utah State University's Year Two Report which found little statistical connection between universities' ability to hire women assistant professors in their engineering colleges and the universities' formal policies (promotion of official programs, assistance in finding jobs for partners, funding for faculty positions or even the size of the urban area) (USU ADVANCE, 2005). FORWARD proposes to study and articulate the gap between policy and its consistent implementation, and to understand not only **if** our programs work, but **how** and **why**. Understanding these mechanisms will assist other gendered institutions in creating and adapting interventions appropriate for their particular settings.

In addition to the research component, our proposal is different from other ADVANCE awardees because we:

- incorporate a 3-year mentoring plan, including reverse mentoring, and help new women STEM faculty connect with women in our community.
- engage male colleagues as Allies.
- phase in university assumption of major funding for sustainability.
- travel in teams to other institutions to disseminate lessons learned and results of research.


WEDNESDAY
December 5, 2007
The Forum
of Fargo-Moorhead
Final edition
www.inforum.com
NDSU discusses lack of female faculty

In an overall sense, we are unique among many of the other ADVANCE awardees in that our challenges have been nationally documented. At the same time, we have tremendous university support and momentum that has been growing since 2002. NDSU stands to make great strides that will serve as a role model for many institutions.

Results from Prior NSF Support

- **DGE-0338128**: $2,000,000. 2004-2009. Graduate student-university-school collaborative for science, engineering, and technology (GraSUS). Co-PI's: D. Schwert and C. Bilen-Green: 2 journal papers, 1 in review.
- **CAREER-0132768**: $374,999. 2002-2008. Research and Education: Biomimetic Design of Biomaterials. PI: K Katti**.** 12 Journal papers, 1 patent, 1 provisional patent, 2 book chapters, 10 invited presentations.
- **IOS- 0445848**: $100,000. 2005-2007. Maternal effects link individual behavior and physiology to population states, PI: W. Reed. 3 manuscripts in review, 5 presentations at national meetings and 3 invited presentations.