



CIC WISE INITIATIVE

Evaluation of the Outcomes

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With assistance from

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University of Wisconsin-Madison**

October 2000

**Evaluation of the Outcomes
of the
Committee on Institutional Cooperation's
Women in Science and Engineering Initiative
(CIC WISE Initiative)**

October 2000

Institutions participating in CIC WISE Initiative

University of Chicago
University of Illinois at Chicago
University of Illinois at Urbana-Champaign
Indiana University
Indiana University Purdue University at Indianapolis
University of Iowa
University of Michigan
Michigan State University
University of Minnesota
Northwestern University
Ohio State University
Pennsylvania State University
Purdue University
University of Wisconsin-Madison
University of Wisconsin-Milwaukee

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Table of Contents

Executive Summary	i
I. Introduction	3
A. The Problem	3
B. The CIC WISE Initiative – Goals and Strategies	3
C. Evaluation Purposes, Methods, and Framework for the Report.....	5
II. Findings: Best Practices Workshops	7
A. Overview	7
B. Outcomes for Individuals	8
C. Outcomes to Home Institutions	9
D. Suggestions for Improvement	10
E. Outcomes Across the CIC.....	10
F. Liaisons’ Perspectives on Best Practices Workshops.....	11
G. Conclusions	12
III. Findings: Leadership Conferences	12
A. Overview	12
B. Outcomes to Individuals	13
C. Outcomes for Home Institutions	17
D. Factors Affecting Follow-Up	18
E. Outcomes for CIC Consortium	19
F. Suggestions for Improvement	19
G. Overall Value – Should the Conferences Continue?.....	21
H. Liaisons’ Perspectives on Leadership Conferences	22
I. Conclusions	24
IV. Findings: Travel Grants	24
A. Overview	24
B. Outcomes for Individuals	26
C. Outcomes for Home Institutions	28
D. Outcomes for the CIC.....	28
E. Suggestions for Improvement	28
F. Overall Value – Should the Travel Grants Continue?	29
G. Liaisons’ Perspectives on Travel Grants.....	30
H. Conclusions	31
V. WISE liaisons’ Perspectives on Outcomes and Implementation	32
A. History and Role of the CIC WISE Panel.....	32
B. Value of the CIC WISE Panel.....	33
C. Benefits of Working Across CIC Consortium.....	33
D. Progress Toward Institutionalization of WISE	35
E. Outcomes for Institutions	36
F. Outcomes for the CIC	38
G. Suggestions for the Future.....	39
VI. Evaluation Analysis and Synthesis	40

A. Factors in Implementation and Institutionalization.....	41
B. Lessons Learned About Institutionalizing WISE Activities.....	46
C. Analysis	47
D. Conclusion.....	50
VII. Appendices.....	53

Evaluation of the Outcomes of the Committee on Institutional Cooperation's Women in Science and Engineering Initiative (CIC WISE Initiative)

Executive Summary

The Committee on Institutional Cooperation's Women in Science and Engineering Initiative (CIC WISE Initiative) was funded by the National Science Foundation from 1996 through December 2000. The Initiative addressed the broad goal of achieving gender equity at each step along the Science, Engineering, and Mathematics (SEM) pipeline across the fifteen participating campuses using three complementary strategies: 1) annual Student Leadership Conferences that focused on "Strategies for Success;" 2) annual Best Practices Workshops for administrators and faculty; and 3) bi-annual Travel Grant Awards for students presenting their research at scientific conferences. The CIC WISE Panel (made up of campus liaisons and three representatives from national associations) comprised a fourth strategy that coordinated the Initiative activities across the CIC as well as promoted individual campus efforts.

This evaluation describes program impacts at three levels: individual, institution, and consortium. It describes factors affecting implementation and achievement, and summarizes progress toward institutionalization of WISE efforts on individual campuses. Findings are based on data obtained during winter 1999-2000 from site visits to nine of the fifteen campuses, interviews with eighty people (provosts, deans, WISE liaisons, faculty, and students), surveys completed by 395 participants, and relevant documents.

Best Practices Workshops: The workshops, attended by 180 faculty and professional staff, were intended to help participants identify, adapt, and institutionalize best practices for recruiting, retaining, and advancing women in SEM disciplines. Workshops addressed classroom climate, undergraduate research, living/learning programs, and mentoring. Respondents reported that the workshops provided vital networking among those involved in WISE-related efforts across the CIC. Of the respondents, 85% reported that they took action upon returning to their campuses by communicating ideas or expanding or initiating new programs. Others indicated, however, that they had insufficient authority to make such changes. Many respondents reported that the WISE-related work was just beginning to gain momentum on their campuses.

Student Leadership Conferences: Over the three years, 553 SEM women and men participated in Leadership Conferences designed to develop the leadership and survival skills necessary for women SEM students to succeed in academic environments. The conferences were successful overall, especially in providing strong SEM women as role models. Students reported gaining confidence, a sense of community, useful strategies, and motivation to pursue their academic goals. These gains, in combination with the supportive network that students developed, played a role in their retention. Students recommended that more information regarding careers in industry and government be provided. The conferences jump-started similar activities on most of their own campuses, thus multiplying the impact to approximately 2,000 more students.

Travel Grants: Travel grants of \$250 from the CIC, matched by the institutions, were awarded to 362 students (20% of the applicants) over four years. Although some faculty, deans, and provosts felt adequate travel grant money is already available to students, recipients emphasized that these funds are difficult to find, especially for travel. By presenting at conferences, students gained confidence, exposure, and expanded networks. For some, it led to publication, or post-doctorate or faculty positions. Many recipients commented that women need to be visible at all major scientific conferences, not just because of the benefits to the individual, but because their

presence will help erode stereotypes about women in science, engineering, and mathematics.

WISE Panel and Institutionalization of WISE: The CIC WISE Panel coordinated WISE activities across the consortium. Liaisons considered the panel structure invaluable for exchanging ideas, benchmarking, and jump-starting campus programs. The CIC provided an effective mechanism for healthy cooperation and competition. Operating as a consortium enhanced the visibility, credibility and accountability of WISE programs in ways not possible if campuses acted independently. The CIC provided critical organizational structure, administrative support, and invaluable leadership. As a result, the bar was raised for all.

This report illustrates different ways campuses adapted organizationally and/or structurally to carry out the Initiative. Institutional staffing ranged from all volunteer to 3.75 FTE; budgets ranged from none to \$140,000. Some WISE units were located within and served primarily one college while others cut across colleges; for some, “science” included only one college, whereas others included more disciplines across the campus. These variations resulted in large differences in an institution’s capacity to participate in and benefit from the CIC WISE Initiative.

As noted, institutions were at different starting points relative to the level of WISE infrastructure and programming. Most campuses experienced positive institutional growth and benefits that may be attributed, in part, to their participation in the CIC WISE Initiative. They created and expanded WISE programs, adapted best practices related to women in science, initiated other WISE activities, and generated external funds. The extent of WISE institutionalization is apparent to different degrees at different CIC institutions: four campuses have achieved seemingly stable footing; the majority of the campuses are working to institutionalize, but believe that consistent long-term efforts are needed; and three campuses show very minimal progress and the current outlook for success is dim.

Liaisons believe the Initiative provided national visibility while complementing local campus activities and that the Panel should continue as an organizing structure and locus of leadership. Liaisons most favored continuing the Leadership Conferences and the Best Practices Workshops.

Conclusions: We present strong evidence that all three activities of the CIC WISE Initiative produced important benefits for the individual participants as well as the majority of the institutions. We conclude that the impact of the WISE Initiative on a campus is a function of the extent to which participants in consortial programs return to implement programs on their own campuses (the “multiplier effect”) *and* the institution’s capacity to support the growth of the individual and WISE-related activities. Even low levels of participation upon returning to campus can reap big returns in a “fertile” institution, whereas individuals returning to “arid” institutions rarely increase the campus capacity. A threshold exists below which there is little multiplier effect for the home institution.

This report finds that the proposed advantages of conducting the Initiative as a consortium were achieved. These advantages include the ability to bring new partners up to speed, increased local and national visibility for WISE issues, better leveraging through combined institutional support, and cooperation in a competitive environment. There is strong evidence that all three activities of the CIC WISE Initiative produced important benefits for the individual participants as well as the majority of the institutions. We also conclude that the Initiative has strong potential to complement local campus goals and can be best realized with sustained efforts to establish at minimum a “threshold” of support for WISE on each campus.

Evaluation of the outcomes of the Committee on Institutional Cooperation's Women in Science and Engineering Initiative (CIC WISE Initiative)

I. Introduction

A. The Problem

Although the number of women in science, engineering, and mathematics (SEM) fields has slowly increased at all stages of the educational pipeline over the past three decades, there is still considerable disparity between the proportion of men and women in these fields. Evidence indicates that small percentages of women matriculate into SEM fields in the first place (especially in the physical sciences, engineering, and mathematics). These disproportionately low numbers of women studying SEM become magnified over time because retention for women is less than that for men. Both undergraduate and graduate women leave the SEM fields in greater proportions than men for a variety of reasons¹ resulting in fewer women candidates for faculty positions. This scarcity of women SEM faculty is further exacerbated by the tenure gap. Nationwide, the CIC accounts for 14% and 6% of the Ph.D. and B.S. SEM degrees earned by women respectively (1995 data). Within the CIC, 25% of the new Ph.D.s in SEM are women and 41% of the new SEM baccalaureates are women. However, there is great variability by field. For example, 11% of the Ph.D. recipients in engineering are women compared to 18% in mathematics and computer sciences, 23% in the physical sciences, and 40% in the life sciences.

B. The CIC WISE Initiative – Goals and Strategies

In 1992, through the efforts of the Women's Studies Directors and the Women's Advocates Network of the CIC, the CIC provosts supported an initial conference focused on Women in Science and Engineering (WISE). An outgrowth of that conference was the development of a proposal, the CIC WISE Initiative, which was funded by the National Science Foundation from 1996 through December 2000.

Goals: This initiative reflects a collaboration across the CIC plus four institutions² toward the overarching goal of "gender equity at each step of the science, engineering and mathematics pipeline." The broad long-range goals of the CIC WISE Initiative include:

- enlarge the pool of undergraduate women who pursue graduate study in SEM fields;
- increase the number of female graduate students who pursue SEM faculty careers;
- increase the number of women who advance through the SEM faculty ranks; and

¹ Seymour, E., & Hewitt, N. M. (1997). *Talking about leaving: Why undergraduates leave the sciences*. Boulder, CO: Westview.

² The CIC includes eleven universities: University of Illinois at Urbana-Champaign, Indiana University, University of Iowa, University of Michigan, Michigan State University, University of Minnesota, Northwestern University, Ohio State University, Pennsylvania State University, Purdue University, University of Wisconsin-Madison. The CIC WISE Initiative included the participation of four additional universities: University of Chicago, University of Illinois -Chicago, Indiana University-Purdue University at Indianapolis, and University of Wisconsin-Milwaukee. Throughout this report the CIC WISE refers to all 15 institutions.

- improve the educational and professional climate for all SEM women.

Strategies: The Initiative targeted upper-division undergraduates, graduate students, and faculty women in SEM through four strategies³, three of which are activities and one of which is an organizational effort.

1. WISE Best Practices Workshops (offered annually for faculty/professional staff)
Goal: To identify, adapt, and institutionalize the best practices for advancing women in SEM disciplines and for improving the campus climate.
2. WISE Leadership Conferences – “Strategies for Success” (offered annually for students)
Goal: To develop the leadership and survival skills necessary for women SEM students to succeed in academic environments.
3. WISE Student Travel Grant Awards (offered bi-annually for women students)
Goal: To promote professional development and socialization into the SEM disciplines through participation in professional conferences.
4. CIC WISE Panel (includes a liaison from each institution responsible for implementing activities on her own campus and coordinating WISE activities across the consortium)
Goal: To provide leadership to faculty and staff and to ensure that appropriate infrastructures, resources, and support mechanisms are implemented so as to achieve and sustain broad involvement in WISE programs.

Table 1, below, summarizes the number of participants in the three activities.

Table 1: Number of participants in CIC WISE Workshops, Conferences, Travel Grants

Strategy	Year -- Topic -- Campus Host	Number*
Best Practices Workshops	1997 The Classroom Climate - Purdue University	45
	1998 Undergraduate Research & Living-Learning - Univ. of Michigan	50
	1999 Mentoring - Univ. of Wisconsin-Madison	52
	<i>Subtotal</i>	147
Leadership Conferences	1997 University of Illinois-Urbana-Champaign	179
	1998 Michigan State University	191
	1999 Indiana University-Purdue University at Indianapolis	183
	<i>Subtotal</i>	553
Travel Grants	1997	74

³ The Initiative also included the publication of annual directories, *CIC Directory of WISE PhD Candidates, Recipients, and Postdoctoral Appointees*, and the compilation of longitudinal baseline data about women in SEM across the CIC. However, these activities were not within the purview of this evaluation. The Initiative also proposed to create a WISE Web (a homepage linking resources) and Electronic Mentoring (CyberMentor); neither project was undertaken.

Recipients	1998	101
	1999	100
	2000	87
	<i>Subtotal</i>	362
	GRAND TOTAL	1062

(* These figures do not include WISE liaisons, who were counted and surveyed separately. Note: A fourth Best Practices Workshop, focused on staff development, was held on May 23-24, 2000. It is not included in the evaluation summary.)

C. Evaluation Purposes, Methods, and Framework for the Report

Purposes: The Associate Director for the Committee on Institutional Cooperation, Jean Girves, (also the Principal Investigator for the NSF grant), engaged the LEAD (Learning through Evaluation, Adaptation, and Dissemination) Center, an evaluation unit located at the University of Wisconsin-Madison, to conduct a third-party evaluation of the outcomes of the CIC WISE Initiative. This summative evaluation had three primary purposes: 1) document outcomes of the four strategies from the perspectives of the participants and implementers⁴; 2) gather information to understand accomplishments and factors that affected outcomes; and 3) investigate “institutionalization” since the 1992 WISE Conference. An overarching question that guided the evaluation was, “What was the value-added of pursuing these activities as a consortium rather than as individual institutions?”

Methods: Evaluation data was gathered through: 1) campus site visits to nine of the fifteen campuses; 2) analysis of pertinent WISE documents and formative evaluation reports conducted throughout the implementation; 3) structured interviews with eighty “key participants” (including students, faculty, and university staff who attended conferences or received travel grants), administrators, deans, provosts, and WISE liaisons; and 4) surveys completed by members of four groups as summarized in Table 2. We received hundreds of participants’ comments and analyzed these inductively to determine common themes. Comments (presented in italics) are selected because they are representative of a widely-held perspective or experience. Each section of the report includes a short overview, findings and supporting data, and a conclusion. Major findings are presented in bold italicized topic sentences to assist the reader. (Methods are described more thoroughly in Appendix A-1)

Table 2: Response Rates for Four Surveys

Focus of Survey	# of Participants	Participants with viable e-mail addresses	# of Survey Respondents	Response Rate (based on total # of participants)	Response Rate (based on # with viable e-mail addresses)
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⁴ The evaluation did NOT gather longitudinal data to determine the achievement of the long-range goals. Nor did the evaluation have an “audit” function, or attempt to make judgments about the progress of specific institutions. Information throughout the report does not identify specific institutions; however, for illustrative purposes we present data on specific institutions where we feel this will broaden the readers’ understanding of the topic under discussion. As much as possible, we have attempted to maintain the anonymity of interviewees and survey respondents.

Best Practices	147	115	52	35%	45%
Leadership Conferences	553	455	162	29%	36%
Travel Grants	362	244	166	46%	68%
WISE Liaisons*	15	15	15	100%	100%

*Many WISE liaisons also attended the Best Practices Workshops or the Leadership Conferences; however, they are not counted here as “participants” because they completed a survey designed specifically for them. Some liaisons completed a phone interview instead of the survey. Speakers and presenters are included as participants..

Framework for Presentation of Findings: Thinking about “spheres of influence”

The strategies comprising the CIC WISE Initiative are designed to make an impact in a variety of spheres: on the individual, the home institution, and on the CIC Consortium as a whole, as shown in Table 3. For example, a strategy may have a *primary* impact on the individual participants but a secondary impact on the participant’s home institution or the consortium. Table 3, which presents the relative degree to which each strategy is expected to achieve outcomes within each of these spheres, is presented to assist the reader in thinking about the intended domains of impact of each strategy. We found that the boundaries among these spheres are often fuzzy. The findings reported here are presented in terms of these spheres.

Table 3: Anticipated Primary Spheres of Influence of Strategies (relative to each other)

STRATEGY	Individual	Home Institution	CIC Consortium
Best Practices Workshops	medium	high	medium
Leadership Conferences	high	high	medium
Travel Grants	high	low	low
CIC WISE Liaisons	medium	high	high

The CIC leaders imply no hierarchy among these spheres. Outcomes accruing to individuals are no less important than those accruing to other spheres or across spheres. In fact, a strong operating principle of these CIC WISE Initiative strategies, especially for students who attended the Leadership Conferences and those awarded Travel Grants, is that increasing the knowledge, skills, and capabilities of women as individuals will contribute to their overall success and retention and thus result in more women in SEM at all levels across institutions.

Outcomes for Individuals

This report makes evident that there are beneficial outcomes to individual participants. All three activities were designed so that the individuals gain by expanding their knowledge, skills, confidence, and networks. While the Leadership Conferences and Travel Grants have a primary focus on the individual, the Best Practices Workshops mainly seek to impact the home institution and the CIC Consortium.

Outcomes for Home Institutions

Just as important, benefits accrue to the home institutions to which the participants return. All three activities are expected to have a follow-up impact, or ripple effect, on the home

institutions, although the degree of expectation about impact varies. Throughout this report we refer to this impact as the “the multiplier effect.” By design, an explicit purpose of the Best Practices Workshops is to share practices and strategies for implementation that can be tried, disseminated, and modified in the home institutions; thus the expectation for outcomes in this sphere is “high.” The Leadership Conferences have high expectations for benefits for individuals *and* for their home institutions. These conferences are designed with an expectation that students who are already interested in becoming women leaders on campus will be motivated to host a similar forum on their home campuses. In contrast, the benefits of the Travel Grants are expected to accrue mostly to the individual participants, although the competition itself may encourage others to seek out such opportunities, and faculty and deans may become more aware of the need for such support.

Outcomes across the CIC Consortium

Benefits to the consortium were expected as a result of raising the bar across campuses, leveraging funds, attracting more of their own to pursue graduate study or faculty positions at CIC institutions, improving retention rates for women in SEM across the CIC, and increasing visibility nationally for the issues and for the progress of the CIC as a collective.

II. Findings: Best Practices Workshops

A. Overview

Goal of the Best Practices Workshops: To identify, adapt, and institutionalize the best practices for advancing women in SEM disciplines and for improving the campus climate.

The three CIC WISE Best Practices Workshops were attended by a total of 180 faculty, administrators, WISE liaisons, staff, and a few students⁵, with the focus on the stated goal—“to identify, adapt, and institutionalize the best practices for advancing women in SEM disciplines and for improving the campus climate.” Each Workshop highlighted a different topic (summarized in Table 4). A fourth workshop, held in May 2000, focused on the staff development of those who work in and with WISE offices.⁶

Table 4: Attendance at CIC WISE Best Practices Workshops

Year -- Topic	Location	# of Participants	WISE Liaisons + others*
1997- The Classroom Climate	Purdue University	45	10
1998- Undergraduate Research and Living-learning Programs	University of Michigan	50	9
1999- Mentoring	Univ. of Wisconsin-Madison	52	14
	Sub-Total	147	33

⁵ Some participants attended more than one workshop, and they are counted double as attendees.

⁶ This workshop is not included in the evaluation summary.

	Grand Total	180
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* Although WISE liaisons actively participated in the Best Practices Conferences, their number is presented separately because they received a different survey from the participants. Their results are conveyed separately. “Others” included personnel from the CIC office and presenters.

Demographics of survey respondents: Of those who responded to the web-based survey, 95% were female. Three-fourths of the respondents stated that some percentage of their professional positions involved WISE-related activities.

B. Outcomes for Individuals

Most survey respondents were quite satisfied with what they gained from participating in the Best Practices Workshops. One hundred percent of the participants rated the workshop as successful in meeting their expectations (combining the top two ratings of four). Below are some representative comments:

I came away with several ideas for the programs I am involved with on campus. It was helpful to see what has been successful so that we do not waste time reinventing the wheel.

[The workshop had] well-selected presentations; written and spoken communications; media lab screenings; informed participants; focused topics; well previewed; excellent handouts; diversity in attendance; radiation of hope and possibilities; practical discourse; realistic concepts; generous lending.

From the participants’ view, the stated goals of the workshops were achieved. Respondents gained essential networks, gathered ideas for best practices for women in SEM, and felt energized as a result of attendance. Among the respondents, 95% thought the stated goal of the workshops was achieved, and 81% felt that the intended emphasis of the conference (“learning how to transfer a successful project and to provide the sustained support needed to fully implement it at other CIC institutions”) was achieved. In addition, respondents gained essential networking with peers, gathered useful ideas, and felt energized, as summarized in Table 5, below.

Table 5: Benefits* of participation in Best Practices Workshops

Benefits	<i>1 greatly</i>	<i>2 somewhat</i>	<i>3 slightly</i>	<i>4 not at all</i>	<i>Total number of respondents</i>
Networked with peers from other institutions	67% 30	20% 9	13% 5	3% 1	45
Discussed practices that were relevant to the needs of women on my campus	62% 23	27% 10	8% 3	3% 1	37
Felt energized and inspired to initiate changes on my own campus	58% 21	33% 12	8% 3	0% 0	36
Learned about difficulties other institutions face and how they’re attempting to resolve those problems	52% 23	45% 20	2% 1	0% 0	44
Learned useful skills that I can implement on my campus	41% 15	49% 18	11% 4	0% 0	37

Gained heightened awareness of the barriers women face in achieving academic and professional success in SEM fields	38% 14	49% 18	11% 4	3% 1	37
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* Survey question was: “Indicate the degree to which you gained the benefits listed below by attending a CIC WISE Best Practices Workshop.” Note: Table combines close-ended web responses and open-ended e-mail responses.

C. Outcomes to Home Institutions

The Best Practices Workshops provided a catalyst to make changes at home institutions. Most respondents (85%) reported that they took some form of follow-up action. When asked, 70% of the respondents said they gained specific information or skills at the workshop that were later useful in making changes at their institution. Some of the changes they noted were:

As a member of Advisory Board, I could compare what was done in other institutions and discuss it with people who are directly involved in Living-Learning Programs on our campus.

[I] have tried to implement more gender equity in both my teaching and when I mentor my TAs about teaching techniques.

We are now establishing a new living/learning program for Humanities scholars. This is partly because of hearing of the successes of other programs at the conference.

With regard to particular actions taken at their home institutions, respondents most frequently talked to colleagues about best practices (89%). Others disseminated information to those with ability or authority to implement the practice (78%), worked to improve socialization and campus climate for female students (68%), or worked to expand mentoring programs for students, faculty, or staff (69%).

Although Best Practices Workshops served as catalysts, there were institutional factors at home campuses, both positive and negative, that affected returning participants’ efforts to make changes. Foremost among the positive factors was institutional support in some form—whether it be material (i.e., funding or space), enthusiasm from administration, commitment, or the spirit of collaboration. One respondent described it in the following way: “[We had] tremendous support from the dean; we won a grant from the university to support our mentoring program.” Another liaison said: “I believe that the visibility of having one of the [Best Practices] Workshops on our campus raised awareness in the Dean’s office. This made it easier to approach the Dean for support in a new project involving the retention of women students.”

Factors that hindered attendee’s efforts to make changes at their home institutions included: lack of materials, money, and “people power to do new things”; lack of support from key campus leaders; attitudes held by some faculty or administrators that sexism and racism no longer existed in the institution; and a political climate that viewed

programs for women as special, favoritism, or divisive. Since many of the participants at the workshops are themselves women in science, a few expressed the additional concern that participating in WISE-related work is risky, as it may hinder their professional progress and academic stature.

I did not tell many of my faculty colleagues about attending the workshop. I believe they would have seen it as a 'waste of my time.'

My performance review will suffer if I contribute too much effort to these [WISE] activities.

[There is a] history of undervaluing work already being done by faculty in this area.

D. Suggestions for Improvement

“Get the right people to attend.”

All of the respondents were pleased with the workshops in which they had participated. A few indicated that attendees were sometimes not the ones with authority to carry out the initiative on their own campus and stated that they wished personnel who were more directly involved in similar initiatives on their home campus had attended. The only criticism about the workshops, in fact, was that “some of the right people did not attend.”

E. Outcomes Across the CIC

Respondents said that involving the CIC in WISE initiatives has a greater impact than launching initiatives in isolation at an individual institution. Conducting Best Practices Workshops for WISE across the CIC provides accountability, credibility, opportunities for benchmarking and peer pressure, and a systemic approach. As a strategy, it “raised the bar” for other institutions in the CIC. When asked to rate the value of addressing institutional change related to women in SEM through the CIC consortium, 100% of respondents rated it as valuable (85% as “very valuable”). The major reasons they gave are summarized in Table 6 with representative comments.

Table 6: WISE Best Practices Workshops across CIC contribute in six ways

Valuable because they:	Representative comment
1. Act as catalysts.	<i>I think that these were excellent forums to disseminate information to help spark change.</i>
2. Allow essential networking among sometimes isolated peers (themselves women in SEM).	<i>Can't beat it as an opportunity for networking. Months after the workshop I was still exchanging information (pamphlets, books, evaluation tools, etc) with people I met there.</i> <i>Only place I've ever been with a large roomful of peers - women in science and engineering. Great networking.</i>
3. Provide accountability.	<i>There is some accountability to the whole group as opposed to one institution.</i>
4. Provide strength by collectively pooling efforts and talents.	<i>There is more strength, money, and energy in pooling efforts.</i> <i>[There is] power in numbers. We have been able to point to the accomplishments of other [peer] institutions which gives more credibility to a need to implement similar programs at our institution. No one wants to be left out if everyone else is doing it.</i>

<p>5. Provide peer pressure, benchmarking, and opportunity to see through others' eyes, thus "raising the bar" for all.</p>	<p><i>Peer pressure goes a long way! Also, especially in hostile situations, it's hard to imagine a way out or way to better the situation; the conversation between institutions is very valuable for imagining what is possible.</i></p> <p><i>Pride in our university can help drive action. When we hear about what other comparable institutions are doing, it is motivating. Also, we can see what works at other large campuses with similar student bodies.</i></p> <p><i>As institutions are expected to measure performance and outcomes, benchmarking efforts against the best practices of other institutions is essential in that effort.</i></p>
<p>6. Address change in a systemic way.</p>	<p><i>[We were able to] learn from each other; capitalize on successes; understand environmental differences; leverage; create a new collective mind-set; make change systemic.</i></p>

Respondents believed that the CIC WISE Initiative is just beginning to bear fruit; thus Best Practices Workshops (focused on WISE) should continue. They identified many WISE-related challenges for the future, and 97% of respondents felt that the CIC was an appropriate organizing body to address these challenges in the near future. For example, one person summarized: *"As a new generation of professionals comes along, there needs to be continuous education and training. This work is just beginning, and the CIC WISE guidance needs to keep providing leadership or campus and college efforts will fail from lack of focus."* Participants suggested the workshop topics shown in the Table 7, below.

Table 7: Topics suggested for future WISE Best Practices Workshops*

<ul style="list-style-type: none"> • Career planning • Address pipeline (K-12 Pre-college efforts) • Recruitment and retention • Challenges of women of color in SEM • Speakers (e.g. women from MIT and women in science outside of academia) • Advisor/advisee relationships and their role in student success 	<ul style="list-style-type: none"> • Funding: Obtaining funding & possibilities under severe budget constraints • Building coalitions • Ways to support women faculty • Developing negotiation skills • Creation of family-friendly campuses • Assessment of successful programs
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* Some of these topics were addressed at former workshops, although the participant may not have attended that specific workshop.

F. Liaisons' Perspectives on Best Practices Workshops

Most WISE liaisons rated their institutions as highly to moderately involved in the Best Practices Workshops, although a few liaisons had difficulty getting faculty to attend the workshops because faculty were so busy. In general, liaisons believed that the Best Practices Workshops were an effective way to connect colleagues working on WISE-related issues and a beneficial way to distribute and showcase successful programs. One liaison summarized, *"faculty came back with great ideas and worked to make things happen on campus."*

Liaisons' Suggestion: In addition to faculty and administrators, student leaders should also attend the workshops. *"They could see what they might come home and argue for on*

their campuses. . . And the students would have the benefit of hearing what's going on at other campuses so they'd get a better view of what's possible."

G. Conclusions

This section demonstrates that the CIC WISE Best Practices Workshops are catalysts for implementation of effective practices to recruit and retain women across the CIC. Respondents thought the workshops provided effective ways to foster institutional changes that support the expansion of effective programs for advancing women in SEM fields and to improve campus climates. Most respondents took some form of follow-up actions to implement best practices on their own campuses. In addition, the CIC WISE Best Practices Workshops served vital networking and support-network functions that energized attendees in their pursuit of initiatives on their own campuses. This network and community had benefits for both individuals, by providing an important inspirational network, and institutions, by the work that was carried out by the attendees. Most respondents felt the work of CIC WISE was just beginning to take hold; thus the Best Practices conferences need to continue. Most felt the CIC provided critical leadership and coordination about WISE across institutions.

III. Findings: Leadership Conferences

A. Overview

Goal of the leadership conferences: To develop the leadership and survival skills necessary for women SEM students to succeed in academic environments.

Over three years, the CIC WISE Leadership Conferences were attended by 553 participants (primarily undergraduates, graduate and post doctoral students, and some faculty and corporate representatives who were presenters), as summarized in Table 8, below.

Table 8: Attendance at CIC WISE Leadership Conferences

Year -- Campus Host	Number
1997 University of Illinois-Urbana-Champaign	179
1998 Michigan State University	191
1999 Indiana University-Purdue University at Indianapolis	183
<i>Total</i>	553

Demographics of Survey Respondents: Of the 165 respondents, 91% were women and 4% were men (5% did not identify their gender). Respondents came from all of the CIC campuses⁷ and represented graduate students (38%), undergraduates (31%), and an equal distribution among post-docs, faculty and administration (although many of these were

⁷ The largest groups of respondents were from the University of Wisconsin--Madison (17%), the University of Illinois-Urbana-Champaign and Indiana University (8% each), with the remaining respondents fairly evenly spread among the other twelve campuses. Students who attended the 1999 conference (IUPUI) made up 58% of the respondents, followed by those who attended the conference in 1998 (Michigan State, 33%), and those who attended in 1997 (University of Illinois-Urbana-Champaign, 19%). See Table 8.

graduate students at the time they attended the conference). They identified their academic areas as life sciences (37%), engineering (25%), or physical sciences (16%); others came from social sciences, education, and humanities. Respondents were 63% white, 28% ethnic minorities, and 8% identified themselves as “international or other”.

B. Outcomes to Individuals

The majority of respondents rated the conferences as successful at meeting their diverse expectations. Seventy-five percent of the respondents rated the conference at one of the two highest ratings (out of four ratings) in meeting their expectations (50% gave it the highest rating of “very successful”). Several respondents had attended two or all of the conferences. One student who attended twice wrote, “*The first time I went I didn’t know what to expect. I just knew it would be a good thing to go to. I was very right. After that I was hooked.*” Some participants described their expectations for the conference as: an opportunity to develop leadership, meet and network with other women in SEM fields, and visit other campuses in CIC. For example some wrote:

I was looking for concrete strategies for succeeding in graduate school and for developing my own leadership style. I also wanted to learn how to begin to develop networking contacts.

I expected to meet other women graduate students, learn from successful women in academics, and develop leadership and survival skills for completing my degree.

I was excited to be surrounded with women who were after the same career path as I am.

Participants thought the CIC WISE Leadership Conferences were successful in meeting the six stated conference goals. Over 80% of respondents rated the achievement of each of the six major goals as positive as shown in Table 9, below.

Table 9: Ratings of Success at Meeting Leadership Conference Goals*

Primary Conference Goals	<i>1 greatly</i>	<i>2 somewhat</i>	<i>3 minimally</i>	<i>4 not at all</i>	<i>Total Respon- dents**</i>
1. Present female scientists, engineers, and mathematicians as role models	72% 84	22% 26	4% 5	2% 2	100% 116
2. Reinforce students’ decisions to pursue careers in SEM fields	51% 59	36% 41	8% 8	5% 5	100% 117
3. Provide opportunities for students to network	51% 58	39% 45	10 13	0% 0	100% 113
4. Offer strategies for academic and professional success	50% 57	38% 44	10% 12	2% 4	100% 117
5. Provide opportunities for student groups to develop plans for campus forums	40% 46	40% 46	17% 20	3% 3	100% 115
6. Develop leadership skills	26% 30	58% 67	11% 13	5% 6	100% 116

* Survey question asked: “Rate the extent to which you think the conference goals listed below were accomplished.”

**Based on 120 respondents to the web survey; some left answers blank.

Almost all of the respondents thought the conferences were valuable, citing important ideas they took away from the CIC WISE conferences and identifying a broad range of important benefits. Respondents were asked to rate the extent to which conference participation contributed to outcomes on 22 different items. Overall, respondents answered positively to 19 of the 22 outcomes listed – that is, 50% or more of the participants rated these items in the top two ratings (among four ratings). We highlight eleven of these themes in Table 10, below. (See Appendix A-2 for full table.)

Table 10: Benefits of conference participation

Beneficial because participants:	Representative Comment
<p>1. Were exposed to role models of strong professional women in SEM. This was one of the strongest outcomes that students identified, with 94% of the respondents rating the conference as effective at providing women in science as role models.</p>	<p><i>[The conference was] an opportunity to network with amazing women from around the United States.</i></p> <p><i>It was very useful to hear the stories of women at various levels in their careers-- faculty, graduate students, and scientists in industry talking about how they got where they are, decisions they made, and problems they encountered. The various seminars on graduate school, applying for fellowships, the process of mentoring/being mentored, and negotiation skills were also extremely pertinent and informative.</i></p>
<p>2. Felt encouraged to persevere in their studies and to move toward their professional goals. 90% said the conference reinforced their decisions to pursue careers in SEM fields.</p>	<p><i>The interaction with other women with similar goals and ambitions was also very refreshing. I returned home with a new sense of purpose and enthusiasm for my graduate studies and career development.</i></p> <p><i>I found it very energizing and inspiring. I learned some great strategies, both general life-skills and specific academic skills (e.g., grant-writing), and I returned to my work more motivated than I had been in quite a while. And it was fun.</i></p>
<p>3. Gained confidence. 70% said that the conference increased their confidence.</p>	<p><i>[It was a] great conference overall. Really helped me see the big picture of women in science. Helped me to find in myself the courage and confidence to go after a desired faculty position. And I got it!</i></p>
<p>4. Gained information about the issues and concerns central to women in science, engineering, and math fields. 93% of respondents said they gained this sort of information.</p>	<p><i>[The most valuable thing I learned was] how to achieve and maintain 'balance' in life, given the demands of work, family, community, etc; learning how the experiences of men and women differ even in the same profession; learning how to identify and overcome barriers to professional success.</i></p>
<p>5. Became encouraged, empowered, motivated, and inspired. 80% of the respondents said the conference made them feel “energized.” Some explained this as gaining a sense of “empowerment” and control over their own academic plans.</p>	<p><i>[The most valuable thing I learned was] that every woman is going to run into an obstacle when balancing career and family lives, but that it is very possible to do. Stay strong, and believe I can do what I want to do!</i></p>
<p>6. Gained a sense of “hope” and a sense of “what is possible.”</p>	<p><i>I have been to many scientific conferences, but being surrounded by bright, ambitious, and capable FEMALE peers and mentors was a whole different</i></p>

	<p><i>experience. I felt myself relax as I heard some of my own concerns voiced by others. I was inspired by the comment of one of the administrators that “we used to try to figure out how to change women so they fit, now we’re trying to change the SYSTEM to better fit the people.” That gives me hope for the future.</i></p>
<p>7. Networked with women from their own and other campuses in the CIC, thus developing or expanding “communities of women in science.” The conferences fostered a community of women in science that, for many, continued after they returned to their home campuses. Some continued to correspond over the years with other attendees. A few requested that the CIC keep the students’ address information in the WISE database even after they graduated, so they could receive important information regarding graduate studies, research papers, etc.</p>	<p><i>I met a lot of great women, learned some valuable lessons on how to present myself, had a lot of concepts about professional relationships that I had already learned from my mistakes reiterated to me, and found a group of people with whom I could work together to make a difference for women and students in the sciences back at my university.</i></p>
<p>8. Reduced the isolation experienced by many women in science. For 68% of respondents, interacting with women in a larger community of women in SEM reduced their sense of isolation. Many described the most valuable thing they took away from the conference as the knowledge “<i>that you are not alone.</i>”</p> <p>Respondents also said it was important for them to meet other women in their <i>specific</i> fields, not just science in general. One conference participant, in fact, expressed some disappointment that there was not another woman present in her specialized field (astrophysics).</p>	<p><i>This conference really helped me get through a very isolated second year of my PhD, during which I was the only female PhD student in my department. . . The conference helped me both by energizing me and by putting me in touch with people at other universities and from other departments at my own university.</i></p> <p><i>“It helped me realize that I am not alone, that many women have been and continue to be successful in science and that you can be happy and learn to endure a hostile environment.”</i></p>
<p>9. Raised awareness of the common issues and experiences that women in science share, so that women don’t have to feel “different.” Some women commented that men are often seen as the “normal” reference point, and they learned that being different does not mean being inadequate or bad.</p>	<p><i>I think attending helps change one’s perspective a little (for the better). It is helpful for each person to realize she’s not the only one who feels and thinks the way she does. If a large number of other women share your frustrations, you begin to realize that your frustrations and feelings of inadequacy are probably not due solely to some unique personal “fault” of your own. You start to see larger patterns, and it’s something of a relief to see how you fit in. On the other hand, seeing problems as shared rather than as unique suggests that group action is advisable. I wouldn’t be surprised if many people became more involved in women in science groups after attending the conference.</i></p> <p><i>The most important concept I took away from the conference is that being different as a female in science is not wrong. Different does not equal weakness.</i></p>

<p>10. Were aided in addressing issues relevant to their personal lives. 29 out of 120 respondents⁸ indicated that the conference helped them address a personal issue by providing motivation and empowerment, expanding their perspectives about their careers, or by broadening their perspective that it is ok to be a woman in science. Some were motivated to communicate more effectively with their advisors; others learned strategies about confidence, conflict resolution, job hunting, balancing career and family, and mentoring.</p>	<p><i>I have had a problem in the past retaining confidence in myself. The conference, in the information presented and in talking to my peers there, helped me to recognize the ways in which I 'put myself down' and come up with coping strategies to change this behavior.</i></p>
<p>11. Developed leadership and increased confidence in their ability to lead. Many students then participated as “leaders” on their home campuses and gained further benefits. Students believed they learned important time management skills along with the ability to delegate, and they increased their opportunities to network.</p>	<p><i>I gained enough confidence to become an officer in a number of organizations, including GWIS and Grad Student Assoc. This resulted in name recognition enough to make involving others and implementing programs much easier.</i></p> <p><i>[Taking leadership] helped me immensely in feeling less isolated and more confident of my leadership skills. It gave me the chance to network extensively with professors and deans from other departments, as well as local professionals.</i></p>

In sum, participants gained motivation in their discipline, felt encouraged and empowered by the possibilities of action, and reduced their common feelings of isolation because of connections they made with peers at the conferences.

Enhanced retention: Taken collectively, the types of outcomes described by students (increased confidence, motivation and inspiration, and decreased isolation) provide evidence that the CIC WISE Leadership Conferences contributed to the retention of some of these women in SEM. Although we do not expect that one event or one experience alone would have such significant impact, a few students stated directly that the conference was a turning point for them. One wrote:

I am finishing up my Ph.D. this spring and I don't think I would have made it this far without the support I've gained through the CIC-WISE program. There are so many times I've thought about quitting but didn't because of friendly e-mails from conference participants, the strategies I learned, and the supportive network on my own campus.

There were some outcomes that small percentages of respondents attained.

Respondents were asked to rate the extent to which conference participation contributed to outcomes on 22 different items. Some of the items we listed were specific to break-out sessions that students attended or other activities offered at the conferences (such as tours of labs). Some of the items were also beyond the *primary* purposes of the conferences; thus we anticipated that the item might apply to some students, but not to all. For example, we asked students whether they “found a mentor” at the conference. Overall, respondents answered positively to 19 of the 22 outcomes listed – that is, 50% or more of

⁸ This question was asked on the web survey only.

the participants rated these items in the top two ratings (out of four ratings). The three items which less than 50% of the respondents said they attained were: networking with potential employers (8%); found a mentor (10%); and learned how to negotiate salary, benefits, and terms of employment (35%). We reiterate that these outcomes were *not the specific focus* of the conference.

C. Outcomes for Home Institutions

The Leadership Conferences served as a catalyst for follow-up activities on the home campus. Table 11, below, shows that 79% of respondents discovered opportunities to play leadership roles on their own campus, and 76% discovered ideas about activities to implement on their campus. Furthermore, 59% of respondents said they became involved in organizations related to women in SEM on their own campus as a result of attending the Leadership Conference.

Table 11: Ratings about Leadership* provided by the Conference

Survey questions related to leadership	1 <i>greatly</i>	2 <i>somewhat</i>	3 <i>minimally</i>	4 <i>not at all</i>	# of <i>respondents</i>
Discovered opportunities to play leadership roles on my own campus	31% 32	48% 49	15% 15	6% 6	102
Discovered ideas about activities to implement on my campus	38% 38	38% 38	19% 19	5% 6	101
Became involved in organizations on my own campus related to women in science	27% 28	32% 33	16% 16	25% 25	102

* Participants were asked to rate the extent to which the outcomes listed above occurred as a result of participating in the conference.

The CIC WISE Leadership Conferences provided a “jump start” for follow-up activities on home campuses. Among the student leaders⁹ who were involved in follow-up implementation on their home campuses, 62% rated it as “very necessary” to hold a CIC level Leadership Conference to “jump start” activities for local campuses. Another 30% felt the conference was “helpful, but not essential” as a jump-start. One who viewed the conferences as essential explained, *“It helped to inspire other women to start organizations and organize other WISE events.”* Another said, *“[The conference was] extremely necessary. I wish I could do it every day. Being surrounded by people with different but similar interests is so inspirational.”* Others described the conferences as providing the *“building block to start from.”* Some respondents had similar views to a student who said, *We needed to see that problems were not a per campus issue, but a national issue.”*

According to student leaders, the conferences provided a “jump start” in the following ways: provided a common starting point and a wealth of ideas; helped students on the same campus get to know one another around a common purpose; inspired student leaders; gave students a sense of what is possible; and expanded students’ perspective by positing women’s concerns as collective issues, not individual problems.

⁹ Out of the 120 survey respondents, 34 students identified themselves as “leaders” who actively participated in coordinating follow-up activities on their home campuses.

Fifty-nine percent of the respondents reported they actively participated in follow-up activities on their home campuses. Thus, the CIC conferences nurtured the development and /or growth of campus-based WISE programs. Conference participants reported a long list of types of follow-up activities that have occurred on home campuses, which included: one-day mini conferences, workshops, poster presentation sessions, seminars, luncheons, panel discussions, K-12 outreach activities (see summary in Appendix A-3). Some campuses were much more active than others. A factor that influenced the level of activity was that campuses varied greatly in the extent of local WISE infrastructure that existed to support the types of activities that could occur. In some cases students were the primary initiators of activities; that is, they took leadership independently, planned and coordinated activities, and did most of the work. In other cases, the home campuses already had a variety of WISE-related activities planned and/or staff to coordinate and implement activities, so many students still were involved, but some took a more secondary leadership role. A few of these wrote:

In all honesty, I'm not quite sure exactly what happened [on our campus]. We decided that there are many resources available to women in SEM already on our campus and we tried to coordinate their activities.

There was no specific follow-up from the group of us who attended the conference because of other groups existing on campus who were doing some similar types of programs.

D. Factors Affecting Follow-Up

Efforts to conduct follow-up activities on local campuses benefited from a variety of local supports, but were inhibited by other factors. Students mentioned the following as facilitators of their efforts: support from others who attended the conference; support from local groups on campus conference (e.g., Women in Engineering office, WISE Program); support from college and graduate school, women in the sciences, faculty, deans, women scientists and engineers in the private sector, and granting organizations.

Although many students said that there were no difficulties in carrying out the follow-up, other respondents identified challenges that affected their progress. These are presented below with representative comments. Liaisons mentioned these same difficulties, in addition to the fact that it required some extra effort to coordinate across other campus programs and events, especially on decentralized campuses. This decentralization made it imperative that liaisons and students know what else was taking place on their campuses, which required that they coordinate with other WISE groups such as GWIS and SWE. Other difficulties included: too many competing activities occurring on campus; logistics of planning; lack of money and time (for students and faculty to coordinate and advise). Additional factors on some campuses were:

- a) Achieving a critical mass of students needed to initiate activities and sustaining this over time. This included getting people together to plan meetings and events, and

keeping people actively involved. Others noted that students were too busy to coordinate such high effort activities without someone in a paid position.

In order for something to happen back home we needed a leader or group of leaders to emerge from the conference. This did not happen. It seemed that no one was willing to take on the responsibility of carrying something out back at home by in large.

I think it takes someone in a paid position to start and coordinate such a large event. Students are too busy although we all wanted to help and do something. [from a student who attended a Leadership Conference]

*I think [the leadership conference] certainly helped [to jump start us] -- however, I would reiterate that you **MUST** somehow require that people who go to these things follow up on their obligations. It was very discouraging to see so many drop outs and to have that heavier of a load due to the drop-out rate. In their defense, I know that at the time I agreed to go to the leadership conference, that it was not made totally clear to me that I would be expected to plan something later.*

- b) Difficulties with overlap of activities coordinated through SWE. Some students said that the goals of SWE or some other student groups seemed very similar to WISE, which required that follow-up activities be conducted in a way that did not appear to be replacing the other groups. A few said that the overlap in goals and activities (particularly with SWE) discouraged some people from joining both groups.

E. Outcomes for CIC Consortium

Given the outcomes to individuals and home institutions that have been discussed, the following types of outcomes may accrue to the consortium as a whole: 1) because Leadership Conferences contribute to individual retention of women in SEM, or at least complement institutional efforts at retention, the conferences increase the pool of quality women candidates for academia (especially candidates in the CIC); 2) the conferences socialize students to recognize the status of CIC institutions (most are Research Universities) by promoting CIC institutions to students as potential graduate school and post-doctoral options; 3) networking across the CIC is likely to result in job offers/faculty positions (i.e. institutions may attract promising candidates from other CIC institutions); 4) the conferences nurture the development of a critical mass of women in science disciplines (especially in science fields with very few women).

F. Suggestions for Improvement

Although the majority of attendees expressed no disappointments or concerns about the conferences, a few offered criticisms or suggestions. The four most frequently mentioned suggestions are summarized in Table 12, below.

Table 12: Suggestions offered by Leadership Conference Participants

Suggestion	Representative Comment
<p>1. Conferences should emphasize careers beyond academia. Students raised this concern spontaneously during interviews as well as through their survey responses. When students were asked whether the conference was aimed solely at women who intend to become faculty at major research institutions 45% held this opinion (12% responded “greatly”).</p> <p>The conference organizers were aware of these perspectives based on evaluation feedback from the first leadership conference. During the second and third conferences, they made efforts to include strategies and presentations related to industry and invited more representatives from industry.</p>	<p>Some of the participants who noted this problem described the conference as “<i>an exceedingly heavy emphasis on academia</i>” or “<i>not enough relevance to people going on to industry.</i>”</p> <p><i>[The conference] did a good job in motivating me to become involved with other women in the sciences, and the importance of those contacts. However, it lacked some of the more critical information regarding women in NON-ACADEMIC science working environments that I was hoping to gain. [caps was in original]</i></p> <p><i>I still have no idea what my career options would really be if I ultimately decide against staying in academia. It was simultaneously both comforting and disturbing to hear how many women thought about leaving academia.</i></p>
<p>2. The concept of “leadership” presented through the conference was not well-defined. As noted earlier, 84% of the respondents rated the conference positively at meeting its goal of developing leadership skills. It seems that many attendees had considerable experience in various forms of “leader-ship;” however, many defined this as participation in student government. The conceptions of leadership presented at the conferences (which emphasized leadership in the discipline and in the science policy-making area) were entirely new to most students, and these views differed considerably from some students’ pre-existing views. About 10-15% of the participants had very different views about leadership or felt that the new views about leadership were not clearly presented to them.</p> <p>The organizers of the conferences were aware of this conceptual difference throughout the conferences. They said that the conferences more accurately emphasize “Strategies for Success,” and after the first year, the conferences were subtitled as such.</p>	<p><i>I already felt quite experienced in ‘leadership’ and felt the conference didn’t expand this.</i></p> <p><i>The leadership aspect seemed undefined. For example, I was the president of a student biological association on my campus, which is clearly a leadership position. Are you implying that *all* women in science are leaders just because they are women in science, or that there is a more defined role? It wasn’t clear to me.</i></p> <p><i>[From a WISE Liaison] Most of the young women that I talk to really didn’t know what leadership meant. They thought it meant running for public office and becoming president of your societies and that kind of thing. They didn’t see it as organizational skills in your lab, doing time management kinds of things, supervising teaching assistants and graduate students and so forth, or working in industry in a leadership role. They didn’t know what that meant.</i></p>
<p>3. The sessions need to remain focused so that participants are not allowed to complain too much. Approximately a dozen respondents thought the sessions allowed students to whine, gripe or complain too much, often about their advisors or programs. One year, a few students thought that the final session became too emotional.</p>	<p><i>[The conference] was a waste of my time. The conference did not promote leadership; it promoted self-pity and the idea that, as women, we need special help in order to make it. In my opinion, that is a self-destructive attitude in the fight for equality.</i></p> <p><i>[There was] too much whining and not enough action. This doesn’t mean stop the program. It just means IMPROVE it and make it more worthwhile. While we were sitting around complaining and sharing our feelings, our male counterparts were</i></p>

<p>4. Diversity, in all forms, needs to be expanded. A few respondents suggested that the conferences could be improved by addressing some of the following topics more directly: race and ethnicity (especially concerns of women of color); life choices (including <i>not</i> to marry or <i>not</i> to have children); and sexuality. We point out that conference attendance was ethnically diverse (20% women of color). One respondent who suggested broadening diversity said, “<i>Those of us in the majority would benefit from these topics too.</i>”</p> <p>Related to diversity of other kinds, some participants observed that there were a few men in attendance, and they felt having male participation was a good idea. A few suggested there should be some efforts to recruit even more men because “<i>having knowledgeable and sympathetic men on board is important.</i>” Some students also mentioned that the conference should continue to advertise to students in the social sciences.</p>	<p><i>out learning REAL science skills. [caps in original]</i></p> <p><i>The conference addressed only the concerns and problems of white female students who aspire to combine marriage, children, and education while in graduate school. The conference offers nothing to women of color, or women who are primarily interested in advancing their education or career.</i></p>
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G. Overall Value – Should the Conferences Continue?

A large majority of respondents believe it is very important that the CIC WISE conferences continue. In addition, a “second wave” of faculty women in science is emerging. Most respondents (95%) said it was important for the conferences to continue. Most students (81%) stated that they would attend such a conference in the future or would encourage others to attend. Respondents described the conference as unique, vital, incredible and extraordinarily important. Several students expressed the belief that “*every woman should attend the conference at least once.*” One dean who participated wrote, “[*Continuing the conferences*] is important and crucial until the appropriate representation level is reached for women in science and engineering.” In addition, students who attended the earlier conferences are now completing their advanced degrees and some are taking academic positions. Many of these said they want to become involved in future Leadership Conferences and they plan to encourage their own women students and advisees to attend. Other student participants expressed similar views below.

[Continuing these is] incredibly important. The conference serves a unique and vital purpose.

[The conference is] very important. It fosters "campus teams," which are most important in disseminating WISP programming and services. Also, it enables women to meet and network with participants from other campuses and fields (professionalization), and highlights the importance of leadership for women.

Some students thought the cross-geographic and cross-disciplinary boundaries of the conference combined with encouragement to dialogue on personal and practical aspects of academic careers were very important aspects of the conference. Students offered

reasons why the conferences should be continued citing that women in particular need more strategies, that there is still discrimination, and that conferences connect women in SEM. Some representative comments are:

Women need hints, tips, and strategies for becoming successful in the sciences. Men seem to already have this help. It is our job to teach future women.

The conference appears to be a potentially helpful arena for younger graduate students or undergrads to make contacts on their own campus and surrounding areas. It is comforting to know there is a program designed to alleviate some of the “discrimination” and “glass ceiling” troubles that we (more experienced students) had to deal with on our own. I would definitely recommend at least one conference to all of my future students.

I think this is an EXTREMELY beneficial conference, which allows women in SEM fields [not only to find out] what to expect and how to deal with it, but also [to understand] the rewards.

H. Liaisons’ Perspectives on Leadership Conferences

Most WISE liaisons said their institutions were highly involved in participating in the leadership conferences. Many campuses had more applications than they could honor. One liaison who described participating in the Leadership Conferences as “high priority,” commented that the number of applications had increased each year (e.g., from 20 in 1998 to 47 in 1999). In contrast, two liaisons said that it was difficult to get enough students together each year.

Impact on students: Liaisons believe that the conferences were very successful at meeting the full range of conference goals, especially the goals of presenting role models for students and offering students strategies for success. WISE liaisons felt that students greatly appreciated the chance to participate in a Leadership Conference. Students formed friendships and associations with others in their fields and gained useful information, strategies, and skills. Many liaisons echoed the opinion of one who wrote, “*The conferences consistently provided wonderful role models for students and provided opportunities, through the varied workshops, for students to develop strategies for success.*” Other liaisons reported that: a) students invited some of the nationally recognized women who had spoken at the CIC Conferences to speak at their local WISE Conferences; b) there was an increased interest in mentoring evidenced by an increase in number of students applying for and participating in MentorNet; and c) the conference generated enthusiasm and energy for the students.

The conference provided students with a network that can help them throughout their tenure as students. The conference also has been energizing students. Most of the students that I traveled with after the conference feel that if so many other people did it, they can do it too.

In sum, the Liaisons observed that, as one put it, *“our students and faculty came back with great ideas and worked to make things happen on campus.”*

After the 1997 Leadership Conference, student participants (some campuses named them “WISE Delegates” or “WISE Ambassadors”) on some campuses established WISE student groups. One liaison wrote that students became particularly interested in creating a WISE group *“because [the conference] raised awareness of the problems for women in SEM fields, like leaky pipelines, lack of mentors.”* Another liaison summarized that students from her campus formed informal networks across departments that are serving as network-support groups that, in her view, are critical. Another wrote, *“The success was quite consistent, partly because several of the first group to go to a conference continued to lead the student groups for the next few years.”* One liaison observed that some students returned with a personal agenda. She explained, *“The most interested students attended the first year. Although the number was less in later years, the impact on each student was consistent--they all returned with a personal agenda.”* Also, there is evidence that one attendee used the advice she learned about negotiating for a faculty position to earn that position. She explained that the department chair still tells her that her package negotiation was *“the toughest negotiation he ever had to do.”* Currently, this former Leadership Conference attendee is a faculty member guiding and advising her own students in SEM. Other liaisons observed that students were successful in their advancement through the pipeline; one reported that the attendees from her campus had all secured internships or full-time positions.

Impact across the campuses: ***Both WISE liaisons and administrators believed it would be difficult for individual campuses to effectively coordinate WISE Leadership Conferences across the CIC. They believed that a CIC-wide Leadership Conference strengthened the undergraduate, graduate and post-graduate WISE activities they already had going on their campuses.*** In contrast, one liaison said that there were so many opportunities for students on her own campus that she questioned the benefit of getting them together with students from other CIC campuses.

Impact on liaisons/faculty/administrators/others: ***Conferences offered opportunities to share, become invigorated, network, and raise awareness among campus personnel.*** All liaisons felt the Leadership Conferences were very valuable and substantive. Most liaisons also thought that it was important for liaisons to attend the conferences because they gained many ideas about what other campuses were doing related to WISE. One liaison described what she valued most about the conference:

comparing notes on climate issues for women in SEM fields, and obtaining ideas on how we can recruit and effectively retain more women in these fields. Our students were pleased to visit other departments and mentioned that it enhanced their interest in seeking graduate or faculty positions at the institutions we visited. It allowed us to discern how we are faring -- what we were doing well, and areas where improvement was needed.

Other liaisons reported that they become invigorated by attending the conferences: *Seeing students learn so much and become enthusiastic after the Leadership Conference reminded me every year of why I am doing this.*”

In addition, liaisons thought that hosting the conference raised faculty and administrators’ awareness of students’ needs and issues of women in SEM. And hosting a conference expanded the possibilities to recruit and integrate faculty into student WISE activities.

Liaisons’ suggestions: Perhaps offer the Best Practices Workshops and the Leadership Conferences on alternate years, or every two or three years. Also consider combining these events into one conference that includes both students and faculty. (One liaison thought this might be a more efficient way to achieve the goals of both events.)

I. Conclusions

Survey responses from 165 participants, as well as interviews with participants and WISE liaisons, indicate that the great majority of these students felt the Leadership Conferences were successful and had a strong personal impact on them. The survey generated hundreds of positive comments about the conferences and their importance to the participants. Participants named a long list of benefits they gained from participation. These types of outcomes offer evidence that the Leadership Conferences contributed to retention for some women students in SEM, or at least provided a strong complement to local campus retention efforts.

There is also strong evidence that involving students in a conference across the CIC benefits the individuals in terms of the skills and strategies they learn, the female role models they meet, and the broad community of women in science that is nurtured. Furthermore, the experience acts as an effective catalyst to get students involved in WISE-related activities on their own campuses. Students listed many types of follow-up activities that occurred on their local campuses that were jump-started by the CIC WISE Leadership Conference. Although the majority of participants were very pleased with the success of the conferences, they did offer a few suggestions – mainly, clarify “leadership” more adequately and expand the diversity of topics.

IV. Findings: Travel Grants

A. Overview

Goal of the Travel Grants: To promote professional development and socialization into the science, engineering, and math disciplines through participation in professional conferences.

Throughout the four-year period of the NSF grant, 362 students were awarded \$250 from the CIC matched by \$250 from their home institution. Applicants were required to have matching funds from their campus to submit an application. Because of the large number of applications the first year, the number of awards was increased from 75 to 100, as

shown in the Table 13, below.¹⁰ Approximately 20% of the applicants were awarded Travel Grant Awards. Overall, 18% of the travel grants were awarded to ethnic minority students.

Table 13: Travel Grant Applicants and Recipients by Year

Year	Number of Applications	Number of Awards	Percentage of Applicants who were Awarded
1 - 1996-1997	445	74	17%
2 - 1997-1998	412	101	25%
3 - 1998-1999	402	100	25%
4 - 1999-2000	518	87	17%
TOTAL	1787	362	20%

Demographics of Survey Respondents: We received survey responses from 165 participants (68% response rate)¹¹ who were very similar in demographics to the total population of travel grant recipients. That is, the majority of survey respondents were Ph.D. students (77%) when they received the travel grant. Not surprisingly, the majority of grant recipients and the majority of survey respondents were in the sciences, with the largest percentage of respondents in the life sciences (38%), followed by the physical sciences (23%), engineering (16%), and the social sciences (11%). Survey respondents came from all of the campuses in the CIC. Respondents reported their ethnicity as white (65%), “international” (16%), Hispanic American (7%), African American (6%), Asian American (4%), or other (2%).¹²

Respondents gave many reasons why they applied for the CIC WISE Travel Grant, including the fact that they needed funds to attend the conference, the grant targeted women, they received encouragement from someone to apply, and it was one of few grants that focused on travel to a conference. The strongest factor that influenced students to apply for a travel grant was that they needed funds to attend a conference (95%). Many commented that very few grants in their field were available for undergraduates or for international students, or for travel in general (in contrast to conference registration). Some students said they applied because they wanted to be a representative for women in science.

Nearly 70% of the respondents reported that an advisor, mentor, or faculty member encouraged them to apply for the award, while 43% had received encouragement to apply from the WISE liaison on their campus. Others applied because: 1) the grant seemed to offer a fair amount of money; 2) the application seemed reasonable and easy; and 3) the application deadline was not too far in advance. Forty-eight percent of respondents applied because they needed funds to supplement another grant.

Participation in scientific conferences was considered extremely important to the recipients’ own professional growth; many had attended or presented at previous

¹⁰ A no-cost extension will allow the CIC to offer travel grants in the Fall 2000.

¹¹ Based on the number of viable e-mail addresses.

¹² No respondents identified themselves as American Indian.

conferences, although these were usually local or regional. Receiving a grant to attend a first scientific conference was especially critical.¹³ Prior to receiving the CIC WISE travel grant, 64% of undergraduates had *not* attended or presented at any professional conferences. However, the majority of master's and doctoral students had attended at least one conference prior to receiving the travel grant (72% and 81%, respectively). Approximately half of the Masters students (51%) had presented a paper/poster at one conference before receiving the travel grant, in contrast to 82% for doctoral students. Attending a scientific conference for the first time was considered especially important:

I have been to many conferences and presented many papers since [the CIC WISE Travel Grant]. I remember greatly appreciating this grant in 1996. The fact that I got it for my first conference paper presentation made me feel proud about my research. I believe the award committee should give a certain number of the grants to first time presenters.

The most common difficulty that recipients noted was that the grant did not cover all their expenses. The mean expenditure was \$912, well above the \$500 students received. Particularly, the award was not enough to cover living expenses for conferences in larger cities or international conferences. Only 14% of respondents attended a conference where the total cost was close to \$500. For 82% of the respondents, conference costs ranged between \$600 and \$1600. To supplement the CIC award, about half of the awardees got funds from an advisor's or faculty member's grant, and 37% of students used personal savings.

Almost 30% of the students said that obtaining an award was so critical that they would NOT attend without it. Some students experienced hardships or incurred debt to attend conferences. One student returned the grant because she was unable to locate additional funding. Another travel grant recipient whom we interviewed was very distraught because she had to pay a significant amount to attend the conference and also had to pay for childcare while she was away from home. Six months after the conference, the family had still not recovered from the expense. This student emphasized it was especially difficult for women in science with children to afford to attend a conference.

B. Outcomes for Individuals

Recipients were exceedingly grateful to have received the grant, even though the grant did not cover all expenses for the majority of students. Recipients described the CIC WISE travel grant as: "valuable," "a great program," "a great initiative," "a wonderful opportunity." We received hundreds of extremely positive statements from grant recipients about how valuable and important it was to attend the conferences that were supported by the CIC WISE Travel Grant. Representative comments are presented below.

¹³ The Fall 2000 Travel Grant awards will focus on first time attendees, but will not be limited to first-timers.

I found the CIC WISE travel grant very useful, first because there aren't many of its kind, and second, because when students are not directly supported by their advisor's grants or are at the starting stages of their careers, this kind of grant provides the chance for participation and recognition.

I think it is an excellent program that I would definitely like to apply for and recommend to other graduate students looking for much needed funds to attend a conference. It allowed me to present my research to other women in WISE and really emphasized the importance of having female mentors that you can look up to.

Travel Grant recipients rated the CIC WISE Travel Grant program as very successful in meeting its major goals of promoting the professional development and socialization of students in science. Ninety-eight percent of respondents rated this goal as “achieved” (i.e., gave the top two ratings among four ratings). In addition, 92% of respondents thought the goal of promoting socialization of students into SEM disciplines was achieved. One student wrote:

One of the most important activities a student can do in graduate school is attend meetings. I am in my final year of graduate school and have met a wide variety of senior researchers through these meetings that I would like to work with as a post doc. Especially for women, networking is awkward, uncomfortable and intimidating; yet networking is so important for career development (everything from establishing collaborations to peer reviewed funding). Especially as a senior graduate student, I believe this meeting is a very important opportunity to network and find out what kinds of career options are available.

Students gained many benefits from attending scientific conferences supported by the award. The six major benefits that were noted by participants are summarized in Table 14, below.

Table 14: Benefits of attending scientific conferences based on the Travel Grant Award

Benefits of attending	Representative Comment
<p>1. Solidified decisions about remaining in science, or provided motivation and intellectual stimulation that encouraged them to stay. 91% of respondents felt encouraged to continue in their field as a result of the conference.</p>	<p><i>The conference really turned me onto academic research and motivated me to go for a Ph.D.</i></p> <p><i>I was so motivated to excel even more now because there is a support group and I have a better sense that I can achieve now.</i></p> <p><i>Women face additional obstacles in science careers and this grant program helps to bridge the gap between men and women scientists by enabling more women to attend conferences and network with peers. Attending this conference definitely increased my enthusiasm for becoming a scientist.</i></p>
<p>2. Gained recognition, visibility for their work, publications, job connections. 94% of the respondents believed their experience brought them visibility for their work and expanded</p>	<p><i>I have just accepted a tenure-track faculty position I was recruited for the position and asked to apply by a professor I met at this conference while he was visiting my poster.</i></p> <p><i>I probably would not have been able to go . . . without that</i></p>

<p>knowledge of their discipline. For some, conference connections led to awards, publications, and employment opportunities.</p>	<p><i>additional financial assistance. This was a very important conference for me, because I organized a session, and the contacts made there have led to my first publication.</i></p> <p><i>At this conference that CIC WISE funded my travel for, I won an “Outstanding Student Paper” award for the poster I presented... Thanks for helping me get there!!</i></p>
<p>3. Gained valuable networking with faculty, researchers, and students. 92% of respondents said they benefited from networking with faculty and researchers in their field, while 86% of respondents benefited from networking with students in their discipline.</p>	
<p>4. Gained increased confidence in ability to succeed in the field. 93% felt the conference attendance increased their confidence in their ability to succeed in the field.</p>	
<p>5. Expanded knowledge of discipline through feedback. Feedback about their research, presentations, and/or posters from experts, scientists, and peers at the conferences was invaluable to students’ understanding of their disciplines.</p>	
<p>6. Considered it an honor to be recognized across the CIC. 73% of the respondents said that they thought there would be prestige associated with grants from the CIC.</p>	

C. Outcomes for Home Institutions

The travel grant awardees were expected to give follow-up presentations at their home institutions. Students that carried out follow-up presentations generally gave a brown-bag type of presentation in their department. A few students said it was not clear to them how to satisfy the presentation part of the grant, and a few others encountered difficulties trying to schedule a presentation. In general though, awardees liked the idea of making a presentation upon their return to campus, and they felt this was an important part of completing the grant.

D. Outcomes for the CIC

Benefits to the CIC consortium as a result of the travel grant awards include:

1. Increased presence of women in SEM from CIC institutions at major scientific conferences;
2. Increased retention for women in SEM in individual institutions and across the CIC; and
3. Expanded pool of women in SEM available for academia.

E. Suggestions for Improvement

Although students were very satisfied with the CIC WISE Travel Grants program, some students offered suggestions. They wanted more funds, more grant application periods, and a clearer grant reimbursement process. Half of the respondents did not face any difficulties in applying for or receiving the travel grant; however, 14% found the reimbursement process confusing, and 10% felt the reimbursement took too long.¹⁴ A few students felt it was difficult to obtain matching funds from their home departments. Others offered the following suggestions:

- Develop a more flexible timetable for submitting grants

¹⁴ Reimbursements were procured by their own institutions.

- Award more money for international conferences
- Develop online submission of applications
- Have an on-campus meeting for awardees to explain reimbursement
- Publicize the following: a) the program more widely; 2) the competitive nature of the grant; 3) a list of the recipients and a summary of what they presented (could be used as a press release and given to the recipients)
- Provide information about additional funding sources
- Clarify the “presentation at home campus” requirement of the grant

F. Overall Value – Should the Travel Grants Continue?

Most recipients emphasized the difficulty of getting funding for conference participation. They felt WISE travel grants should continue because they fill a critical need. In contrast, many campus administrators, deans, and department chairs felt that money for travel grants is probably available from other sources. Thirty-eight percent of respondents felt other funding would *not* be adequate to accommodate women students if the CIC WISE Travel Grants were not available, while the majority (57%) was unsure about the availability of funds.

Respondents felt it was important to have Travel Grants earmarked solely for women. Most respondents (93%) felt it was important to have travel grants solely for women. Over 70% rated this as “very important” for the specific reasons summarized in Table 15, below.

Table 15: Reasons Travel Grants are needed especially for women

Reasons	Representative Comment
<p>1. Women are not as assertive as men in pursuing opportunities. They may need additional incentives to apply. Recipients said that having a special grant for women gave them an added incentive to apply because networking is often awkward, uncomfortable or intimidating for women.</p>	<p><i>Female graduate students may not be any more or less able to pay for attending conferences than male graduates students; however, I feel that among my fellow students females ARE less likely to attend conferences (especially national ones).</i></p> <p><i>Especially for women, networking is awkward, uncomfortable and intimidating -- yet networking is so important for career development (everything from establishing collaborations to peer reviewed funding). The symposia that I have attended have been extremely useful in my learning how to meet and approach other scientists, become comfortable with the science 'network' (which can seem like an established club) and meet the people in my field.</i></p> <p><i>It is important to encourage women to attend conferences. Often their confidence is lower than their male counterparts and it offers a touchstone for comparison. Also, women are generally underrepresented in these fields, so it's important to increase numbers of women attendees.</i></p>
<p>2. Women are very under-represented in the sciences, and there is still bias and discrimination against women in SEM. These grants may</p>	<p><i>There are very few women in physical sciences, and fewer continue into academia. Even in the most open-minded programs, the latent attitudes that women should teach and men are better at research are discouraging. Any support or pat on</i></p>

<p>encourage women to become more active in their fields and assist them through the pipeline.</p>	<p><i>the back helps!</i></p> <p><i>I am amazed by the favoritism given to male students even in my generation. Not just by academic faculty, but by families. Women need to know that we can do it too; we can be successful and well educated and still remain socially acceptable. By giving women a hand-up, not a hand-out, you say “Here is the first step, with many more to come.”</i></p> <p><i>As women scientists are often soft-spoken when it comes to promoting themselves and seeking out the opportunities they deserve, I think a travel grant program solely for women is important in order to expose ALL scientists to the larger research community outside of their home university.</i></p>
<p>3. Women often do not have access to the informal social networks that allow male students to connect more readily with resources.</p>	<p><i>Male colleagues, who for a variety of reasons may be more confident or aggressive in their pursuit of personal achievement, are often more likely to receive funding from departments, etc., who are “like them,” i.e. mostly male. While certainly not impossible, it seems harder in my opinion for women to make as aggressive a case. Travel grants solely for women, at the very least, eliminate this fear and allow women students to concentrate on their science, and not departmental politics or attitudes.</i></p>
<p>4. Some faculty are reluctant to support conference attendance for women because they think expenses for women students are more than for men.</p>	<p><i>Because my advisor had no other women students, he commented that it was very expensive to send me to conferences because I could not share a room. I believe that obtaining funding from CIC helped to make this issue less important in his mind. He was more receptive to providing partial support for my attendance.</i></p>
<p>5. Participants believed that it is critical that women in science be visible at all major conferences. Some recipients emphasized that the CIC WISE Travel Grants need to continue not just because of the benefits to the individual, but because the presence of women at scientific conferences will begin to erode stereotypes about women in SEM. Furthermore, broad visibility of women in SEM at all major scientific conferences will begin to “educate” the predominately male populations that there are many intelligent women scientists who have something to contribute to the knowledge-generating process and to the specific scientific disciplines.</p>	<p><i>Very often, it seems as if women are just not considered for grants and awards, even for merely attending conferences. My entering class was greater than 40% women, [but] when I would go to conferences I very seldom saw other women students. I think that we have to make ourselves visible. Grants aimed at highlighting women are very important for a while longer.</i></p> <p><i>The increased opportunity for women to travel to national or international meetings is very important to increase the exposure both of women to different aspects of their field of interest, but also to increase the recognition of the increasing role of women in science.</i></p>

G. Liaisons’ Perspectives on Travel Grants

The number of travel grant applications at the campus level increased over time, indicating a large need. As the grant program became more recognized on campuses and communication with departments expanded, the number of applications for Travel Grants

increased. For example one set of campus applications grew from 26 (spring 1999) to 84 (spring 2000). Unfortunately, only about 20% of the applications that were received were funded. Moreover, we do not know how many students did not submit applications because they were unable to find matching funds. With one exception, the liaisons thought that student interest and faculty support for the Travel Grant Program was very high and cited this as evidence of a large need for such grants.

A few liaisons believe it is beneficial to continue offering the WISE Travel Grants at the CIC level, rather than at the campus level, for two reasons:

- 1) Increasing recognition for the recipients *across* the CIC is important. Students viewed the award as more significant and competitive because it was earned in competition across the CIC (in contrast to at the home institution only).
- 2) The CIC selection process may be less subjective because it uses external reviewers who do not know the specific students and do not take into account the departmental or campus “politics.”

Most liaisons viewed the travel grant funds as very important for the overall professional-ization of students in SEM. Some said they observed increased confidence and proficiency in their students after attending conferences. One liaison noted that, “All [of the travel grant recipients] went on to complete their degrees.” Liaisons also felt that the application process was a good exercise for students to participate in, even if students were not awarded the grant. Liaisons also believed departments differed greatly in their availability of funds, that department funds seldom cover all expenses, and that administrators were, on the whole, pleased to offer matching funds. The liaisons concluded, therefore, that the CIC WISE Travel Grant Awards significantly reduces the financial barriers of attending these conferences.

Some liaisons thought that this program helped to raise campus awareness that students, and women students in SEM in particular, need additional professional development support. They felt that Travel Grants for women helped assure that women in SEM are present at conferences that are customarily male-dominated, that and the grants “*did a lot to raise awareness of women in science fields and their issues.*” Others believed that advertising the travel grants increased the visibility of WISE on the campus, not just for students who might apply, but for faculty and administrators who may need to be reminded of the particular constraints that women in SEM may experience. They also believed that the grant program improved students' perceptions that departments recognize and value their research activities, sending an important message to female students that they are valued and important members of the scientific community.

Liaisons' Suggestions: While most liaisons experienced no difficulties carrying out the travel grants program, a few had problems. A few students had trouble finding matching funds, and it was hard to get the word out, especially to undergraduates, because some campuses lacked communication links to students.

H. Conclusions

Travel grants were awarded to 362 students over four years, approximately 20% of the applicants. Through their participation at conferences, students gained confidence, increased their interest in their research and discipline, and gained exposure while expanding their networks with scientists and potential employers. Many recipients believed that attending scientific conferences contributed to their retention in SEM. For some, the participation led to publications, or increased visibility for post-doctorate or faculty positions. Many recipients commented that women need to be visible at all major scientific conferences, not just because of the benefits to the individual, but because their presence will help erode stereotypes about women in science. Although some faculty, deans, and provosts felt adequate travel grant money is available to students, recipients emphasized that these funds are difficult to find, especially for travel. Even with the grant, most respondents incurred debt to attend the conference, as the mean cost was approximately \$900. This type of grant is highly valued by students, and all types of participants want to see travel grants for women in SEM continue in the future.

V. WISE liaisons' Perspectives on Outcomes and Implementation

A. History and Role of the CIC WISE Panel

This CIC Women in Science and Engineering Initiative was first recommended by the CIC Women's Studies directors and later endorsed by the Women's Advocacy Network and the Liberal Arts and Sciences deans in the fall of 1990. The CIC chief academic officers established a planning committee that culminated in the CIC Conference on Women in Science and Engineering, held in October of 1992. Each campus sent a team of faculty, academic professionals, and students to discuss issues facing women in SEM fields and to draft action plans to address them on their campuses. A CIC action plan was also drafted to address activities that could be better implemented by the consortium.

The campus action plans were discussed with provosts, deans, other administrators, and various student and faculty groups at each institution and then were compiled in one CIC document.¹⁵ This 1992 conference and its initial activities served as the catalyst for subsequent campus and consortial activities. By June of 1993, the CIC members adopted two recommendations:

1. Establish a CIC WISE Panel¹⁶ responsible for coordinating WISE activities across the consortium and for considering ways and means for sustaining and institutionalizing continuous improvement in enrollment, graduation, employment, and advancement of women in the science and engineering fields.
2. Provide the support and leadership needed to achieve genuine, long-lasting change.

¹⁵ "Advancing Women in Science, Engineering, and Mathematics: Campus Action Plans."

¹⁶ In addition to the WISE liaison from each campus, the CIC Panel includes one representative from each of the following: American Association of Colleges and Universities; Association for Women in Science (AWIS); and Women in Engineering Program and Advocates Network (WEPAN).

The WISE Panel has met annually to exchange information about their campus programs and to implement the consortial action plan. The first product of the collaboration was the annual *WISE Directory of Ph.D. Candidates and Recipients and Postdoctoral Appointees*, which was published in 1994. In 1995, the WISE Panel proposed the CIC WISE Initiative to the National Science Foundation, and it was funded beginning in 1996 and extended¹⁷ through December 2000.

B. Value of the CIC WISE Panel

The CIC WISE Panel provided the backbone for carrying out the CIC action plan and the NSF-funded CIC WISE Initiative. The Panel structure was considered essential in administering campus activities and connecting them to the broader CIC WISE Initiative. The primary benefits of the Panel cited by the liaisons were:

- **One campus point of contact.** Information regarding all of the activities within the WISE Initiative was available in one location making it easier for faculty, students, and other liaisons. Promotion and management of the different components through one office increased visibility on campus and reinforced the importance of the overall Initiative.
- **Network of support and encouragement among liaisons.** One of the most consistent messages that liaisons expressed was the importance of the network of support that was provided through the CIC WISE panel. Many liaisons reported that a cross-institutional network of peers doing similar work was critical to their success because many of them “single-handedly and without support” administered WISE activities. They indicated that it would be very difficult to accomplish the stated goals without this network. For some, getting together and working with liaisons across the CIC raised their hopes about what was possible on their own campuses. Interactions among liaisons and the CIC coordinator provided opportunities to share creative ideas, information, and benchmarks. Liaisons learned from each other’s experiences, and reinforced one another’s commitment to the goals of the WISE Initiative. They viewed the meetings as a good opportunity to plan future activities.
- **A “jump-start” for campus programs.** Sharing effective strategies across the CIC was essential. Liaisons benefited from the experience of others who were “one step ahead,” and as a result they did not have to “re-invent the wheel.”

C. Benefits of Working Across CIC Consortium

Most WISE liaisons believed there were significant benefits of working on WISE programs as part of the consortium, as opposed to doing so as individual institutions. Only two liaisons said that their institutions had not reaped benefits as a result of being part of the consortium, although they both observed benefits to individuals who had participated in activities. The majority, however, emphasized that collaboration across the CIC was beneficial in six important ways summarized below.

¹⁷ It received an 18-month no-cost extension.

1. CIC provided critical organizational structure, administrative support, and invaluable leadership that institutions could not have provided themselves. Liaisons felt that the CIC provided a structure that helped them organize the activities on different campuses. Without this structure, individual campuses would have had difficulties reaching their current levels. Some said this organization and administration provided by the CIC was particularly important for campuses that are initiating new programs. Most importantly, liaisons thought that collective efforts had a higher rate of return for the individual as well as for the local institutions than individual campus efforts.

Liaisons said that the initiative would not have proceeded without the strong coordination and leadership at the level of the CIC. All of the liaisons described the CIC leadership very positively, using words such as central, essential, key, very valuable, extremely important, showing tenacity and persistence, terrific! Another said simply, *“This [Initiative] wouldn’t fly without [CIC coordination].”*

We have had an effective and committed leader who has been critical to the success of this program.

It is crucial to have someone in the CIC office that initiates and coordinates activities for the CIC institutions.

CIC leadership has made it possible for us to develop joint programs, share resources, and accomplish goals. It has provided a center as well as administrative support.

2. Supportive network of peers who share knowledge and experience – critical mass. Working on this initiative across the CIC WISE Panel helped develop a critical mass that is missing in a single institution. Moreover, fifteen campuses working on similar initiatives seemed to legitimize WISE-related efforts on each campus. They shared knowledge and experiences and used one another as resources. This reduced the sense of isolation that some liaisons felt. One liaison described the Initiative as *“a shot in the arm.”* Another described the CIC connection as the *“best resource to promote learning and retention of females in SEM.”*

3. Effective communication about WISE across the CIC, not only among the liaisons, but also across many other CIC groups with an interest in WISE activities. The Associate Director of the CIC (who also served as the Principal Investigator for the CIC WISE Initiative) participated on the WISE Panel and in regular meetings with other CIC committees (e.g., Liberal Arts & Sciences Deans; Graduate Deans; Provosts; Women’s Advocacy Network; Senior Diversity Officers). This pivotal position provided a critical connection between the CIC WISE Initiative and other CIC committees interested in recruiting, advancing, and retaining SEM women at all levels.

4. Participation across the CIC generated visibility and credibility. Some WISE liaisons explained that carrying out features of the grant such as advertising and gathering applications from students generated much needed publicity and visibility on campus.

One explained, “*It boosted our efforts and gave us credibility. It also generated the notion that it was important to participate in order to keep abreast with other CIC institutions.*” Others said that activities coming out of the CIC are perceived as very important because “*top administrators take the CIC seriously.*”

5. Healthy cooperation and competition raises the bar for all. Most liaisons believed that the collaboration across CIC strengthened them all. Cooperation allowed them to develop campus programs “*because others already had them in place. Instead of reinventing the wheel, we have simply adapted to our campus, programs that exist elsewhere.*” One explained that “*trying to one-up the others [in the CIC] leads to progress!*” The benchmarks and reference points provided by the other institutions helped each one assess her own progress. One liaison described how peer pressure played a role in establishing a campus Women In Engineering Program:

I believe the major strength is the informal ‘peer’ pressure that it places on each institution’s administration to do something about women in engineering and science. I do not believe our Women in Engineering Program would have begun as early as it did without the WISE Conference in 1992. Even though [our campus] is one of the top engineering schools in the nation . . .it did not see the need to have a Women in Engineering Program until the CIC WISE Initiative.

6. Students and faculty benefited from high quality programs. Liaisons likewise explained that they would have a difficult time on their own organizing such high quality student leadership conferences. The stature and connections of the CIC made it possible to identify and attract nationally recognized women leaders as speakers to the conferences and workshops, and made Travel Grants more competitive, but also more prestigious.

D. Progress Toward Institutionalization of WISE

Defining “Institutionalization of WISE”

The WISE liaisons each assessed the effects of participating in the CIC WISE Initiative, paying special attention to efforts to institutionalize WISE on their campuses. To present their views, we begin with their definitions of “institutionalization of WISE.” Liaisons were asked, “What factors would be present if WISE were institutionalized on your campus?” Taken collectively, their responses result in the following definition. WISE is institutionalized when: 1) there are regular activities of student WISE groups; 2) there are programs developed by departments aimed at women in SEM; 3) programs which are currently administered by WISE (through grants and other soft moneys) are incorporated into standing campus-wide activities; and 4) there is a campus-supported WISE program.

In addition, we asked liaisons to identify evidence that would convince them that progress is being made *toward* institutionalization. This generated two additional factors: 5) adaptation of WISE-related best practices at CIC institutions; and 6) added coherence and continuity to existing WISE activities.

Several WISE liaisons defined institutionalization as the achievement of specific long-range goals for women in SEM fields. These goals included: 1) increase in percentage of female students graduating in departments where they are presently underrepresented; 2) increase in percentage of female faculty in departments and in administrative positions; 3) increase in percentage of women advancing to the next step along the pipeline; and 4) decrease in complaints of sexual harassment and hostile work and campus environments. The analysis of the attainment of these long-range goals will require longitudinal data over years. In this document we do not consider these indicators because too little time has passed to show significant change. This evaluation focuses on looking at the institutionalization of WISE in terms of the more immediate impact of the strategies from the perspectives of the participants and key stakeholders.

Assessing the extent of institutionalization of the WISE Initiative programs is complicated.

CIC WISE programs vary dramatically in their infrastructures, level of staffing, and amount of internal and external funds available -- all of which directly impact their ability to undertake WISE activities and to carry out their portion of the CIC WISE Initiative. Several campuses already had strong women in engineering or women in science programs in place when the WISE Initiative began, giving them an advantage in carrying out the CIC WISE programs.

Given the complexity of these institutions and their numerous relationships with many other organizations promoting similar goals, it is difficult -- indeed, not feasible -- to try to identify activities and actions (outcomes) that have arisen as a *direct and sole* consequence of participation in the CIC WISE Initiative.

E. Outcomes for Institutions

1. Implementing the Initiative across decentralized campuses required liaisons to develop infrastructures, relationships, and communication networks that, for most, did not exist previously. The majority of the CIC institutions are very large and decentralized. Carrying out the three activities required the liaisons to improve coordination and communication among various groups on their campuses. Many had to create an infrastructure from scratch. For example, in order to identify students or faculty who might participate in the CIC WISE activities, the liaisons needed to develop ways to identify “women in science” in every department; to communicate with and develop connections to students, faculty, deans, chairs, and departments; to create mailing lists and databases; and to interact with a range groups and programs aimed at women on their campuses, not just women in science and engineering. One liaison explained, “*The CIC WISE activities gave us an incentive to become more organized and to coordinate activities.*”

On a related point, the liaisons also established connections with minority programs on campus to help them recruit ethnic minority women to WISE activities. Thus, as a result of the Initiative they developed links with organizations on campus that expanded WISE opportunities (not just CIC WISE activities, but all campus WISE) to diverse populations.

These linkages were viewed as an important long-term benefit. Overall, minority women in SEM accounted for approximately 20% of participants in CIC WISE activities.

2. The Initiative catalyzed WISE-related activities and organizational changes on home campuses. Most campuses experienced some positive institutional growth and/or outcomes over the period of the grant. The CIC WISE Initiative had a direct influence on many campuses implementing WISE activities. Liaisons reported that the following types of activities were prompted by their participation in the CIC Initiative, although the list is by no means exhaustive.

a. WISE groups and programs were formed and expanded.

- Prior to 1992, only two campuses had women in science programs; now half of them do.
- Several campuses have created or re-activated student organizations such as SWE, AWIS, and local leadership programs.
- Women in engineering programs were expanded to include science, and a women in science program added engineering to its portfolio.
- Women in engineering programs were established or re-activated.

b. Best practices have been adapted.

- *Mentoring:* Many campuses increased mentoring for female undergraduate and graduate students in SEM fields (several joined MentorNet).
- *Climate Theatre:* At least four campuses are using Climate Theatre. Others have purchased the materials and hosted workshops.
- *Undergraduate Research:* Many have initiated research experiences for undergraduates.
- *Living-Learning programs:* Eleven campuses started living-learning programs or residence halls.

c. Additional WISE-related activities and programs were initiated or expanded.

- Research opportunities for women in science
- Pre-college programs
- Scholarships for freshman
- Incorporation of WISE in departmental grants
- Women's speaker fund
- Greater involvement of faculty in symposia and summer camps
- Active involvement in campus student leadership conferences
- Grant writing was successful for some

d. Institutional support for staff and programming increased.

e. Organizational structures at home institutions were expanded.

- One program became an independent unit reporting directly to the vice president for research.
- Campus-wide advisory committees were formed.
- Formal ties and connections with relevant groups and administrators were established.

Two institutions reported that no changes *to the institution* occurred over the period of the grant. They felt that individual students had benefited greatly from the conferences and travel grants, “*but organizationally or systemically, there has not been any change.*” These two, in fact, had no supporting infrastructures, as WISE activities were carried out by volunteer liaisons who had other full-time responsibilities. Another liaison reported that previously there had been some structure and a full time staff for a pre-existing initiative, but that activity was eliminated when there was a change in provost.

F. Outcomes for the CIC

Progress since the 1992 WISE Conference

One of the purposes of the evaluation was to ascertain to what extent the goals that were set out during the 1992 WISE Conference were achieved. Each institution’s goals for WISE were presented in a follow-up report.¹⁸ During our interviews with provosts and deans, we mentioned this report, but found that the majority of the interviewees had no knowledge of the report. Although we probed about the general progress made toward these goals, we did not try to count the extent to which specific goals were accomplished. Provosts believed that their campuses had made progress over the past ten years to improve the success of women Consortium-wide. In particular, they mentioned many campuses have implemented efforts to recruit women faculty; developed policies/programs for spousal hiring or partner accommodation; established mentoring programs for women; developed special orientation and training programs to heighten the awareness of faculty; established tenure extension policies; developed on-site childcare and/or subsidies; completed or are conducting pay equity studies and rectifying discrepancies; given tenure to more women on CIC campuses; increased the number of women in upper-level administration.

In addition, the 1992 report presented a “Consortial Action Plan” which laid out goals related to WISE for the CIC as an administrative hub specifically. These goals and a statement of progress made toward each goal are summarized in Table 16. In sum, progress was made on 6 of the 8 goals (two goals, over time, were not considered worth pursuing).

Table 16: Achievement of 1992 Conference Goals for the CIC

Stated Goal	Progress toward Achievement
1. Establish baseline data on enrollments, degrees conferred, etc	Data was published in 1996 which will be used as the baseline for contrast with recent national data.
2. Maintain an inventory of WISE program and resources (e.g., summer research opportunities for high school students)	A website was planned but never realized.
3. Conduct consortial workshops	Most topics addressed through Best Practices. Workshops and Leadership Conferences – a major thrust of CIC WISE Initiative.
4. Implement Name Exchange of undergraduate juniors interested in attending graduate school	This was modeled after the minority name exchange conducted by the Access panel. They decided it was no

¹⁸ Titled: *Follow-up to the 1992 CIC Conference on Women In Science and Engineering: Campus Action Plans*

	longer cost effective for them, so it was not pursued.
5. Publish directory of CIC WISE Ph.D. candidates and degree recipients	Directories published annually since 1994. Will appear online in November 2000.
6. Facilitate the communication and networking among women scientists, engineers, mathematicians across the CIC institutions	Partially fulfilled through Best Practices, Leadership Conferences, and WISE Panel. Also facilitated by the formation of new WISE offices on campuses. Never focused on it, but some activities occurred.
7. Inform and involve the relevant CIC committees	Accomplished throughout.
8. Prepare annual report on the progress of the CIC institutions in increasing the recruitment, retention, and advancement of women in SEM fields	Through semi -annual CIC staff notes supplemented by this evaluation and reports currently under development.

G. Suggestions for the Future

Liaisons believed that WISE efforts should continue to be coordinated through the CIC. Most liaisons felt this collaborative activity has made sense and has been beneficial. Many felt this was a natural connection, particularly since the provosts and deans meet regularly. CIC is recognized among administrators across campus, which gives WISE greater credibility.

Most liaisons said that the three-part CIC WISE Initiative should continue. They felt that it has given visibility to local campus efforts and it appropriately complements local campus activities. Of the three activities, liaisons were most in favor of continuing the Leadership Conferences and the Best Practices Workshops, although there were differences of opinion. The Best Practices Workshops and the Leadership Conferences were seen as being slightly more important than the Travel Grants because they had a follow-up impact on the home campuses and therefore would affect larger numbers.

Additional challenges or issues that should receive attention. Provosts and deans whom we interviewed also offered suggestions about areas that needed attention. Their ideas are integrated here with the liaisons' suggestions and are identified as such.

1. Recruitment (a priority for provosts and deans):

Suggestions: develop a CIC WISE summer program for pre-college women; promote recruitment through scholarships; offer meetings for high school students to help expose them to different SEM careers; identify young women who have talent in SEM to participate in summer camps and research opportunities.

2. Influence K-12 SEM pipeline (also considered very important by provosts and deans):

Many people whom we interviewed suggested that the CIC ought to think about how to get involved in improving K-12 education in math and science, encouraging and maintaining girls' interest in math and science and creating opportunities for girls to get excited about SEM.

3. Expand collaboration between WISE and minority programs (also suggested by deans

and provosts): strengthen connections between WISE and SROP, Sigma Xi chapters, and Women's Studies. WISE is currently linked to the Summer Research

Opportunities Program. Between 18% and 22% of the participants to Leadership Conferences and awardees of Travel Grants were minority students.

4. Continue to share Best Practices: suggested topics include: recruiting and retaining women

faculty (a priority among provosts and deans), mentoring, improving climate for women.

5. Involve administrators, faculty, and departments more in WISE activities:

Liaisons

recognized that there needs to be more communication with disciplinary departments, department chairs, and key decision-makers in order to get them more involved, integrated, and supportive of WISE programs. Find ways to bring these people together to heighten awareness of the issues and focus on systemic change. Also consider linking new women faculty in similar disciplines across the CIC campuses.

6. Advocate at national level for more attention to needs of women in science at all levels:

Several liaisons are very active at the national level in advocating and promoting WISE related programs and activities.

7. Continue research and evaluation: The CIC longitudinal data about WISE is essential. The

Baseline Data Report highlights differences and similarities among institutions, and this should be reported on a regular basis to assure progress. There needs to be more information about what works. Research across the consortium should be conducted.

8. Seek grants or corporate funding (also noted by deans, provosts, and many others).

9. Continue to meet as a group (CIC WISE Panel) in a central location.

VI. Evaluation Analysis and Synthesis

The purpose of this section is to discuss factors that affected the implementation of the CIC WISE Initiative and the attainment of outcomes. The section is meant to illuminate understanding about implementation, not to compare or judge specific institutions. This section also illustrates the different ways in which programs have adapted organizationally and/or structurally to carry out the CIC WISE Initiative and other WISE-related activities. An important feature about the CIC WISE Initiative is its flexibility in implementing programs across institutions. The Initiative gives a charge to institutions but does not define how to implement it on their campus. This explains, in part, the variability of adaptations among institutions and why insight into which factors are key to success is important. Our purpose is to highlight the role of organizational structures and other factors, so that readers can use this information to assess their own campus “potential” to successfully undertake WISE programs.

The data for this section comes primarily from interviews and/or surveys completed by the fifteen WISE liaisons. Where applicable, we have integrated the perspectives of provosts, deans, faculty, program directors and/or implementers of WISE-related activities. Some of these factors were identified spontaneously in interviews, while others arose when we asked liaisons to identify “barriers and/or facilitators” to their work, or

when we asked them to summarize the “lessons they have learned” while carrying out the CIC WISE Initiative.

A. Factors in Implementation and Institutionalization

We found that the success of this Initiative was influenced by a combination of interrelated institutional factors, such as the depth and breadth of advocacy for WISE, and the existence of organizational structures supporting WISE.

1. There are diverse organizational structures and staffing arrangements for WISE-related activities.

Campuses display a range of organizational structures to carry out WISE-related activities, and staffing and funding levels varied significantly. Some are centralized; many are very de-centralized. Organizational structures range from “no formal structure” in which a lone faculty member or university staff voluntarily carries out WISE-related work, to informal voluntary student groups and advisory committees, to formalized funded units with advisory committees and industry representatives. Some had no funding, some had funding from one source, and some received funding from several colleges. Staffing ranged from all volunteers, to minimal compensation at 5-10%, to levels of staffing for WISE of approximately 1 FTE, to one campus that totaled 3.75 FTE.

Table 17 illustrates the full range of WISE organizational structures and compensation by presenting information about four CIC campuses. The table reports five features: 1) WISE liaison percent time; 2) staffing; 3) core funding; 4) source of funding; and 5) structure.

Table 17: Range of WISE Organizational Structures and Staffing across CIC

<p style="text-align: center;">CAMPUS A “No formal structure, all volunteer”</p> <p><i>WISE Liaison:</i> volunteer (faculty) <i>Staffing:</i> none <i>Core funding:</i> none <i>Source of funding:</i> Not applicable <i>Structure:</i></p> <ul style="list-style-type: none"> • Meetings of voluntary committee <p><i>Comment:</i> To carry out work, WISE liaison contacts 18 academic colleges</p>	<p style="text-align: center;">CAMPUS B “Formal structure, all volunteer”</p> <p><i>WISE Liaison:</i> volunteer or 5-10% <i>Staffing:</i> none <i>Core funding:</i> none <i>Source of funding:</i> Not applicable <i>Structure:</i></p> <ul style="list-style-type: none"> • Overseen by one of four deans in College of Engineering • Advisory committee
<p style="text-align: center;">CAMPUS C “Formal structure, liaison compensated”</p> <p><i>WISE Liaison:</i> 10% <i>Staffing:</i> 25% coordinator and 50% secretary <i>Core funding:</i> none <i>Source of funding:</i> has been external <i>Structure:</i></p>	<p style="text-align: center;">CAMPUS D “Formal structure, liaison & staff compensated and core funding”</p> <p><i>WISE Liaison:</i> 75% <i>Staffing:</i> additional 3.0 FTE <i>Core funding:</i> \$120,00 annually <i>Source of funding:</i> derived across six deans <i>Structure:</i></p>

<ul style="list-style-type: none"> • Administered through campus-wide Center for Research on Women & Gender • WISE Liaison Reports to Vice President for Research 	<ul style="list-style-type: none"> • Administratively located in the President's Office; supervised by the Vice President and Provost • Steering Committee of six deans defined broadly across entire campus • WISE Executive Committee of Faculty/Staff from six colleges. • Advisory Board of industry representatives.
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NOTE: Examples labeled as Campus A, B, etc., represent actual campuses in the CIC. The same label for a specific campus is used throughout the section. That is, Campus A in one diagram is the same institution as Campus A elsewhere.

Campus A exemplifies an “all volunteer, no formal structure” design in which the WISE liaison was a volunteer and there was no formal structure. As “volunteer only” designs, these are generally marginalized and peripheral. Our interviews revealed that WISE liaisons in this status were usually over-committed on many projects, and the CIC WISE Initiative was one more additional responsibility. This design makes the progress and success of the effort dependent on the idiosyncratic and unique qualities of the person who is serving as WISE liaison. As such, the design is subject to turnover and burnout, resulting in general lack of continuity over time. In this design much effort was spent on trying to legitimize and bring visibility to the activities for women in SEM (CIC WISE and otherwise), as well as working to develop connections and supporters.

Campus B represents a design that is almost voluntary (it is 5-10%). It is such a small compensation that it remains peripheral. It also has some aspects of a formalized structure, such as an advisory committee, and has some breadth of advocacy since it is overseen by deans in the College of Engineering.

Campus C illustrates a low level of compensation for the WISE liaison and some additional staffing, but the WISE efforts have been externally supported through grants.

Campus D illustrates major WISE infrastructure that includes: large proportion of liaison compensation (relative to others); strong staffing and budget; broad source of funding across campus; and broad definition of “science” (involving many colleges across campus). Examples of staffing from two campuses that are similar to Campus D are presented below:

<p>Campus E (1.4 FTE) Director* – 20% Program Coordinator - 40% Coordinator of. Develop - 50% Secretary- 10% Admin. Assistant- 20%</p>	<p>Campus F (3.75 FTE) Director* (Asst. Dean) – 100% Program Coordinator – 100% Secretary – 50% Graduate student - 50% Student workers – 75%</p>
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*Director is the WISE liaison.

Several liaisons said the most important lesson they learned about carrying out the initiative and working toward institutionalization was “the Initiative must be central, not peripheral.” Many felt very overextended as WISE liaisons because their commitment was voluntary, and they had no staff or organizational support. Thus, working on the Initiative was a peripheral activity, not their primary commitment. This

dependence on volunteers or compensation at 5-10% seemed totally inadequate to carry out the demands of the Initiative and still allow time to work on expanding WISE programs, grant-writing, or fostering institutionalization. This view is illustrated in the following representative comments from two WISE liaisons:

We have learned that this sort of initiative cannot be implemented solely by volunteers. A coordinator is necessary for continuity and effectiveness. Institutional support is necessary for this.

It is hard to be aggressively implemented when it's a peripheral responsibility. Too much to do, too little support to do it!

2. There is a broad range of core budgets for WISE-related campus activities.

There is a large range of core annual budgets for WISE-related infrastructure and activities, resulting in large differences in capacity to implement programs and obtain additional grants. Core budgets for WISE-related activities ranged from none (or compensation for “lunch for the steering committee”) to \$140,000 provided by deans across the campus plus the provost’s office. As one might expect, the amount of core funding available impacted the staffing level, the number of WISE activities, and importantly, the amount of time liaisons spent on grant writing. Liaisons supported at less than 15% time said they had no time to write grants. In contrast, the four liaisons with more staffing reported they spend 10-60% of their time on grant writing. Liaisons who have received grants tend to be at campuses that have at least a moderate level of support. This has resulted in the old adage: “Those who have – get more.”

Funding reflects the depth and breadth of advocacy for WISE-related activities; Dependence on one “champion” leaves the program vulnerable. The amount of funding for the WISE core budgets may reveal the *depth* of campus support for the activities, and the sources of those funds usually reveal the *breadth* of the support for the project. In looking at this issue, one might ask the following questions:

- Are all the funds from one college or are the funds derived *across* the campus?
- Are the core funds dependent upon *one* person, one department, or one college who is an advocate, or are they distributed among *many* advocates?
- How consistent is the funding over time?

Many WISE liaisons were working persistently to expand their advocacy base and improve both their breadth and depth of support. One long-time advocate for WISE activities on one campus who was about to retire recognized the dependence of the WISE program upon his/her support. This person is working with the WISE liaison to create a long-term endowment that would support the program after the advocate retires.

3. How inclusive is “science?”

What does the “S” in WISE mean? Some CIC institutions defined science broadly (as in Campus D in Table 18, below) to include nursing, psychology, pharmacy, veterinary medicine, agriculture, and others. In this example, Campus D is truly a *campus-wide*

program because it includes women in *every science-related college* on campus. In contrast, other campuses defined science narrowly (as in Campus G below). In this case, it is defined as the “College of Science” which includes only the physical sciences, the life sciences, and mathematics.

How broadly “Science” is defined within the CIC WISE Initiative usually determines who receives services and access to programs and opportunities. The definition is often related to the “base” of support for the program: the sources of funding, the relationship to “champions,” and where WISE is housed (if not literally, then at least administratively).

Table 18: Two Campus interpretations of “Science” for WISE Programs

<p>Campus D -- “Science” broadly defined Initiatives are funded through money from provost’s office and money from deans from every college (6) on campus</p> <p><u>CIC WISE Initiative served students from Colleges of:</u> Agricultural Sciences Earth & Mineral Sciences Engineering Health & Human Development Liberal Arts Science</p>	<p>Campus G -- “Science” narrowly defined Initiatives are funded through Deans in College of Science or College of Engineering</p> <p><u>CIC WISE Initiative served students from Colleges of:</u> Science (Physical Sciences, Life Sciences, & Math) Engineering.</p> <p>DOES NOT INCLUDE: Agriculture, Nursing, Pharmacy, Veterinary Medicine, Medicine, or Psychology</p>
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4. Relationship of WISE to Engineering Colleges varies.

Thirteen of the campuses offer engineering degrees, and many had strong, well-established women in engineering programs prior to the CIC WISE Initiative. The creation and growth of some WISE programs has been complicated by the existence of these engineering programs while others have clearly benefited from the engineering model. Several campuses that now have both Women In Engineering (WIE) and Women In Science programs (WISP) have developed very congenial and cooperative relationships. Others are experiencing tensions. Several liaisons described this difficulty, but one is illustrated below:

We don't have a WISP at [our campus] and SWE is tremendously active. I always thought that having WISE located in Engineering meant that SWE and WISE were competitors - that worked against us and our students.

Campuses have developed a variety of configurations to place WISE (WISP) in relationship to Women In Engineering programs (WIE). Institutions have taken one of three approaches to relating science and engineering: a) WISE is placed within Engineering, but serves some colleges outside of engineering; b) WISE is a campus-wide effort that is open to engineering and other colleges; or c) WISE serves colleges outside of Engineering, which has its own separate program (WIE).

5. Decentralized campuses complicate achievement (although this is not unique to WISE).

Many institutions are decentralized, so it's difficult to create a sea-change; in addition, women's programs are fragmented, and champions are often dispersed across departments, so it is hard to achieve a critical mass. In many cases, leadership also needs to come from deans of colleges and department chairs. Moreover, when there are many programs for women on campus, there is often a lack of coordination. There is sometimes a lack of synergy among programs that could energize each other. This can result in pockets of people across campus unknowingly duplicating one another's efforts.

6. The climate for women in science is still chilly.

The entire CIC WISE Initiative is directed at ameliorating the chilly climate that continues to act as a negative factor in the implementation of the CIC WISE Initiative. WISE liaisons and others informed us that this issue plays out in several different, but interrelated ways, which are summarized below.

a. The majority of WISE liaisons are themselves “women in science,” which presents its own problems. One liaison explained that *“under the best circumstances, to be respected the WISE liaison should be a women in science, and yet, there is little time to be a scientist and a liaison unless there is an institutionalized office and staff.”*

b. Women's issues are often marginalized. WISE liaisons expend tremendous energy raising campus awareness and trying to legitimate the issues that need attention. Many liaisons found themselves over-extended, over-volunteered, and yet under-rewarded because they participate in “service” activities that are not research, and that are not rewarded or necessarily valued within academia. Two liaisons described their greatest challenges as, *“Always having to ‘prove’ that barriers which preclude women from succeeding in these fields are extant”* and *“[There is] not enough recognition that there need to be more women and that we need to do things differently to recruit and retain women.”* A third liaison explained:

I think everybody's thankful that I'm the one who's [the liaison]. . . I want to do it – it's out of my own time, not part of my position. Because in the end I'm going to be judged on my research -- teaching may be a little important, but not as important as research. The bottom line is how many dollars you're going to bring in. . . The WISE thing falls under services. And services are really not a big factor in tenure. With all that said, I do enjoy doing it.

c. There is ambivalence about special treatment, and there may be repercussions for women who advocate for women. Since affirmative action programs are under review and attack, several campuses are reluctant to move ahead. This political climate impacted the CIC WISE Initiative in a number of ways. Some students who participated in the Leadership Conferences or were awarded Travel Grants felt torn because they know women are under-represented, but they do not want special treatment. Even when the students were not ambivalent, they said that faculty members, advisors, or male peers reacted negatively to the idea of a conference or travel grants for women. In these cases, they had to justify their participation to their peers, advisors, or faculty.

The dilemma of special programs for women arose in two other situations relative to the CIC WISE Initiative: 1) One campus' experience showed that assigning a woman to the position of WISE liaison did not necessarily mean she would advocate for opportunities for women; and

2) Some women faculty feared repercussions if they took advantage of these programs or if they advocated for women. They are sometimes viewed as less serious about science or stigmatized as radical feminists.

This chilly climate applies both for students who want to participate in WISE campus programs and the CIC WISE strategies and for faculty women, such as liaisons, who risk being labeled, stigmatized, or devalued because of their participation in activities that support women. Many provosts commented that they see it as their responsibility to create a climate that is welcoming to women, but they acknowledged that when an institution is so decentralized or faculty-driven, it can be difficult for central administration to effect change.

7. Many CIC WISE liaisons lack authority to promote WISE on their campuses.

About half of the WISE liaisons are faculty. Others are deans or professional staff. Some are directors of units that include WISE related activities. Still, some WISE liaisons said they lack authority to promote WISE on their campuses. A lesson about implementing the Initiative that one liaison offered was, *“The CIC liaison must be someone in administration who has some authority.”* For example, another liaison commiserated that having little authority made the task of getting updated lists of women students who were enrolled in degree programs into a major challenge.

B. Lessons Learned About Institutionalizing WISE Activities

Liaisons were asked to offer “lessons” they learned during the implementation of the CIC WISE Initiative. The majority of their insights reflect the factors discussed above. They said:

- 1. The Initiative needs to be “central, not peripheral.”** That is, having liaisons as volunteers in addition to their other full-time duties, or having them at 5-10% time with no staff or minimal staffing is ineffective.
- 2. Liaison should be organizationally located in science as well as engineering.** Since their responsibilities cut across colleges, it would be more effective to have the WISE office located in an ‘umbrella’ unit such as academic affairs or research.
- 3. The CIC liaison must be someone who has authority.** Large bureaucracies can consume too much time and energy in order to accomplish even a simple task.
- 4. Start a WISE student organization and list-serve earlier.** The involvement of students in the initiative provided impetus. Liaisons found students very helpful in assisting with WISE projects, and others felt that students gained very much from networking with each other through WISE.
- 5. Within decentralized campuses, campuses need to acknowledge there are benefits of coordination and information sharing.** One liaison summarized:

It is important to recognize that a great deal is happening on our campuses that is not centrally controlled. Student groups in various schools, colleges, and even individual

departments support women faculty and students in various ways. Having said that, we acknowledge the benefits of more coordinated activity and information sharing.

6. Develop and maintain direct contact with the provost. Keeping the provost informed of

the progress of programs and activities is essential to obtaining continued support.

7. Multiple concurrent approaches are needed. Colleges, departments, labs, and classrooms

all have different cultures. Therefore, many programs and strategies are needed.

8. Recognize that it takes a long time to institutionalize. One liaison said she would start

sooner to work on institutionalization, but then went on to say, *“I don't think the campus was ready until recently.”*

9. These are exceptionally challenging goals that will take a long time. One liaison wrote,

“The difficulty of this challenge is real, and improvement is slow. It requires consistent approaches over time.” Another expressed the opinion that the CIC WISE Initiative was a valuable jump-start, but critical mass is not yet achieved.

Institutionalization across campuses is progressing, but needs continued long-term consortium effort. She wrote:

We are just beginning to see ‘institutionalization’ of some of our women in science and engineering activities. We try to work with the [many] engineering departments on various activities so that they feel ownership in the WIE Program. . . I feel that if the WISE Initiative were not to be continued that much of what was gained in terms of institutionalization would be lost. We are just beginning to make headway after this three-year period, and I would hate to see the initiatives discontinued.

C. Analysis

In this section we present two key analytical concepts and discuss the implications for action.

1. “Multiplier Effect” and “Institutional Capacity”

The premise of the CIC WISE Initiative is that individuals (or teams) who participate in meaningful activities will acquire knowledge, be inspired, and return to support and implement WISE-related programs on their home campuses. That is, a “multiplier” or ripple effect will occur. The purpose of these strategies is to build the *capacity* of the individual to succeed personally and of the university to progress generally.

There are important factors at the home institution that affect the individual’s ability to foster a multiplier effect. These include: the campus leadership, the climate for women, the presence of a critical mass of SEM women students and faculty, and the WISE-related infrastructure. For the purposes of this discussion, we will refer to this combination of factors as the “fertility” or capacity of the home institution.

Table 19, below, illustrates the relationship of the CIC WISE Initiative to the home institution.

Column A: The overarching strategy is to build the capacity of the individual to contribute/lead at the home institution. The steps include: 1) identify potential implementers who are leaders and those in position to implement, advocate and support; 2) enrich them with ideas, knowledge, inspiration; 3) encourage interaction with others across the CIC; and 4) send them home motivated to develop programs.

Column B: This column represents the home institution to which the energized individual returns. It illustrates the continuum of institutional environments from “arid” to “fertile.” It asks the questions: “Do the culture and organizational factors at the home institution make for an arid or fertile environment? Is there structure, leadership, and support at the home institution to build upon the participant’s knowledge, skills, and energy?”

Developing individuals who return to “arid settings” is like “spreading seed on sand.” The investment in these people is probably lost, or certainly not maximized. Much of the energy of this group is spent on “survival” in contrast to “growth.”

Individuals returning to mid-level or to high fertility find a critical mass of colleagues, momentum, and stable, legitimized efforts. These institutions often have other WISE-related activities occurring and additional opportunities for students to continue to grow and, perhaps, to lead. Even a small level of participation by individuals can reap big returns to the home institution as a whole, because there are many other helpers and none are over-taxed.

Table 19: Relationship of CIC WISE Initiative to Capacity of Home Institutions

<p><i>Column A</i></p> <p>CIC WISE INITIATIVE</p> <p>WISE Panel Leadership Conferences Best Practices Travel Grants</p>	<p><i>Column B</i></p> <p>CAPACITY OF HOME INSTITUTION RELATED to WISE</p> <p>(“Fertility” means capacity to develop persons & programs)</p>
<p>Purpose: Build capacity through professional development = growth</p> <p>Step 1: Identify person/program with potential</p> <p>Step 2: Nurture/enrich person/program with: Ideas/Knowledge/Skills Inspiration/Excitement Commitment Belief that person can contribute (empowerment)</p> <p>Step 3: Interaction with others across CIC</p> <p>Step 4: Send person home to nurture change, expand, and accomplish</p>	<p>Fertility = campus environment + commitment + structure</p> <p>ARID FERTILE</p> <p>No structure Structure No commitment Strong, visible commitment Volunteer only Staff & Volunteers</p> <p>Marginalized Legitimized</p> <p>Transience Continuity</p> <p>Isolation Critical Mass</p> <p>Energy spent on survival Energy devoted to growth, combating not survival factors above</p> <p><u>RESULTS</u> <u>RESULTS</u> Growth of small patches large fields A few sparse seeds Many collective seeds Annual Perennial</p>

2. A “Threshold” Effect

The idea of the “fertility” of the home institution may suggest that there is a minimal level, or threshold, below which there is little or no multiplier effect. We found that the liaisons at “arid” institutions were struggling to both participate in and reap benefits from their involvement in the Initiative. Liaisons at institutions with moderate support and staffing believed they were making some progress toward addressing the broad SEM goals. Even institutions with stable infrastructure and relatively adequate staffing (“very fertile”), said their campuses still benefited by fresh ideas and energized students that returned from the Leadership Conferences, Best Practices, and Travel Grants. However, their campus WISE activities were not so dependent upon these students or faculty.

3. Implications for Action

Institutions might assess the strength of their WISE programs by asking the following questions:

- What are the key features this institution needs to modify in order to enhance its capacity?
- Are WISE activities marginalized on this campus?

- Is staffing and funding at least at a threshold or above so that it can cultivate progress? What is the breadth and depth of this campus's support? Is there continuity? Can the program focus on "growth" instead of survival?
- What can be done to assure strong relationships between WISE and Women in Engineering programs?
- Does this institution's definition of "science" (relative "Women in Science") have sufficient scope to provide access of services to the intended audiences?

D. Conclusion

In general, there is strong support from provosts and deans for the concept of leadership conferences, best practices workshops, and travel grant programs. The provosts and others we interviewed had positive things to say about these three activities and viewed them as valuable strategies to employ in moving toward the goal of increasing the pool of women in SEM fields. One provost described the initiative as "brilliant" because it crossed all levels and each strategy focused on different audiences, so that the strategies effectively complemented one another. Some provosts stated that they've provided financial support for the WISE activities and saw them as being both effective and cost-effective. Others believed that in some cases, the CIC WISE Initiative is similar to other activities taking place on individual campuses, but they felt the repetition was valuable because it drives home a necessary point. In addition, provosts offered the following comments:

- *There isn't a provost in the country who doesn't recognize the shortage of women in science and that we have to take crucial steps.*
- *[The CIC WISE Initiative] is not one of the CIC initiatives that anyone worries about. People feel that it's going pretty well. We only talk about the programs that are in trouble at our meetings, so I think the fact that we haven't talked about this one means it's important and wonderful.*
- *All the provosts have a stake in the success of the CIC WISE Initiative because, whether or not they are scientists themselves, they have a responsibility for the science and engineering programs on their campuses.*

One provost commented that Sheila Tobias, some people at NSF, and people involved in the WISE program have become our "collective conscience" and force us to think about things in new ways.

Interviewees of all types (provosts, deans, faculty, WISE Liaisons, and students) thought that the CIC is an appropriate and respected body to coordinate this Initiative. This is fundamental, in that the grant had proposed or hypothesized that "the CIC offers advantages not usually found in individual campus efforts."¹⁹ These advantages are listed in Table 20 below. Based on interview and survey responses from participants and WISE liaisons which have been presented throughout the report, we rated the extent to which these advantages were "realized."

¹⁹ On Page 10 of the proposal.

Table 20: Extent to which hypothesized advantages of CIC collaboration were realized.

Expected Advantages	Extent to which realized	Comments
1. Better stability of programming as personnel changes occur	Yes	CIC leadership was stable; leadership/champions at some campuses changed, and some liaisons had changeover
2. The ability to bring new partners up to speed quickly	Yes	Sharing across campuses made for a steep learning curve
3. Greater local and national visibility	Local-yes National-yes	Several presentations at national conferences; Articles in On Campus with Women, AWIS, AACU, and WEPAN links
4. More effective program operation through economies of scale	Yes	CIC Office provided critical coordination and leadership
5. Better leveraging of combined institutional support as annual allocations fluctuate	Yes	Level of involvement by each institution changed over time
6. Vertical integration of programs, involving provosts, deans, department heads, faculty, and students	Somewhat	On some campuses (related to fertility of home campus); the CIC provosts and deans groups were informed of program status and progress
7. Cooperation in a competitive environment, generating peer pressure to excel	Strong	Mentioned by provosts, deans, liaisons and others as an important element

Not only did the collaboration across the CIC present advantages that were positive (shown above), the advantages benefited the individual, institutions, and the consortium. As illustrated in Table 21 below, the Initiative has built capacity at the individual, institutional, and the cross-CIC levels. There is ample and strong evidence that all three strategies of the CIC WISE Initiative (carried out by the “backbone” strategy – WISE liaisons) are producing very strong outcomes and benefits for the individual participants. There is also ample and strong evidence that the majority of the home institutions have benefited from the multiplier effect that the Initiative sought to create.

Table 21: Spheres of Influence of CIC WISE Initiative

	Effects on Individual	Effects on Home Institutions	Effects across CIC Consortium
Best Practices	Limited by design	Perceived by most as a strong multiplier	<ul style="list-style-type: none"> Raises the bar - institutions either get to “show off” or discover they are “trailing the pack” CIC progresses toward goal of “equity of women in science”
Leadership Conferences	Strong to Very strong Contributes to retention	Generally good multiplier, although effect stronger where there is some structure at home institution Contributes to retention	<ul style="list-style-type: none"> Because it contributes to individual retention, it increases the pool of quality women candidates for academia (especially candidates in the CIC) Socializes* students to recognize status of CIC institutions by promoting CIC institutions to students as potential graduate school and post-doc options Networking across CIC likely to result in job offers/faculty positions (i.e. institutions may attract promising candidates from other CIC institutions)

			<ul style="list-style-type: none"> • Nurtures a critical mass of women in disciplines (especially engineering and sciences with very few women)
Travel Grants	<p>Very strong</p> <p>For some, contributes to retention</p>	<p>Limited multiplier effect</p> <p>Priming the pump</p> <p>For some, contributes to retention</p>	<ul style="list-style-type: none"> • Contributes to retention and thus increases pool of quality women candidates for academia (especially candidates in the CIC) • Socializes students into the academic disciplines

*Socialization process includes: Exposure of students to CIC as institutions of a similar type (RUI – “Research University I”). This opens students’ eyes to prospects of working with/at other CIC institutions, and allows participants to see facilities and meet faculty at other CIC campuses. This is particularly critical for those in science (who are the primary audience of this strategy) who generally go directly into Research University I settings for post-doctorate and faculty positions.

However, progress toward institutionalizing WISE is apparent in different degrees at different CIC institutions. That is, four campuses have achieved seemingly stable footing; the majority of the campuses are working to institutionalize their programs, but believe that consistent long-term support and commitment to those efforts is needed; and three campuses show very minimal progress and the outlook for success is, at present, dim. Based on results shown throughout this report, we conclude that the CIC WISE Initiative has been extremely strong for individuals, but the potential of the benefits to the home institutions could be effectively realized by: reviewing the “threshold” of support; re-assessing other institutional factors of leadership, advocacy, and organizational support and acting accordingly; and considering suggestions offered by students, faculty, WISE liaisons and other stakeholders which appear throughout this report.

VII. Appendices

Section A-1: Explanation of Evaluation Methods

Campus site visits: LEAD Center evaluators, Dianne Bowcock and Charlotte Frasca, conducted one-day visits to nine of the fifteen CIC institutions which were selected to represent a range of WISE efforts in terms of level of activity and institutional support.

Document analysis: We reviewed documents that summarized WISE activities on individual campuses (e.g., yearly plans, conference summaries, agendas), and minutes and staff meeting notes from the CIC.

Open-ended interviews: LEAD evaluators conducted interviews²⁰ with 80 “key participants” including students, faculty, and university staff who attended conferences and workshops or received travel grants, as well as senior administrators who were involved with and cognizant of WISE efforts. The WISE liaison at each campus developed an interview schedule with deans, directors, and provosts who were involved in or knowledgeable about CIC WISE. Interviews, ranged from twenty minutes to one-hour, were audio tape-recorded (with permission from the interviewee), and then transcribed. Evaluators analyzed the transcripts using an inductive process to identify issues and themes. The information from initial interviews was also used to guide the development of surveys.

Surveys: Four different surveys were used, each directed at a different audience: 1) faculty/staff who had participated in the Best Practices Workshops; 2) attendees at the Student Leadership Conferences; 3) recipients of the CIC WISE travel grants; 4) CIC WISE liaisons. Many of the WISE liaisons attended the Best Practices Workshops and the Student Leadership Conferences, although for the purposes of this analysis, the WISE liaisons are not considered “participants.” The first three audiences received web surveys (followed later by shortened e-mail surveys, as described below), while the liaisons received surveys via e-mail only. The surveys can be reviewed on the LEAD Center website at <http://www.cae.wisc.edu/~lead>

We attempted to survey all the participants at the three Best Practices Workshops and the three Leadership Conferences, as well as awardees of the Travel Grants for the past four years. We compiled a master list of e-mail addresses from existing CIC WISE records. To verify the viability of the e-mail addresses, we sent a short e-mail message to all participants saying that a survey would be forthcoming. Through this process we found many non-functional e-mail addresses. In Table A-1, below, we present response rates based on the entire population who attended the activity and also on the number of people who had viable e-mail addresses whom we think actually received our request to complete a survey.

Participants with viable e-mail addresses were then sent an e-mail message asking them to complete the survey at the designated web sites. A few people notified us that they had

²⁰ Interviews were conducted in a variety of formats: individual face-to-face interviews, phone interviews, and group interviews.

difficulty entering the Best Practices Workshop web survey, but in general the web surveys seemed to work effectively. To increase the survey response rates for the Best Practices Workshops and Leadership Conferences, we shortened the web-version of the survey and e-mailed it to those who had not yet responded. As a result, the web survey included some questions that were not asked on the e-mail survey. Both types of responses are reported. In addition, the shortened e-mail survey included more open-ended questions than the web-survey, and these open-ended responses were coded and merged with the web-survey responses where appropriate.

Table A-1: Response Rates for Four CIC WISE-related Surveys

Focus of Survey	Total # of Participants	Participants with Viable E-mail addresses	# of Survey Respondents	Response Rate (based on total # of participants)	Response Rate (based on participants with viable E-mail addresses)
Best Practices	147	115	52	35%	45%
Leadership Conferences	553	455	162	29%	36%
Travel Grants	342	244	166	49%	68%
WISE Liaisons	15	15	15	100%	100%

Note: Many WISE liaisons also attended the Best Practices Workshops or the Leadership Conferences; however, they are not counted here as “participants” because they completed a survey designed specifically for them. Speakers and presenters are included as participants.

Table A-2: Ratings of benefits gained by participating in Leadership Conference

(based on 120 responses to web-survey) (presented in descending order)

Benefits	1 <i>greatly</i>	2 <i>somewhat</i>	3 <i>minimally</i>	4 <i>not at all</i>	Total
Was exposed to professional women in science, engineering, and math who were excellent role models	59% (61)	33% (34)	5% (5)	3% (3)	100% (103)
Felt encouraged to persevere in my studies	55% (56)	35% (35)	4% (4)	6% (6)	100% (101)
Gained information about the issues and concerns central to women in science, engineering, and math fields	53% (54)	40% (41)	5% (5)	2% (2)	100% (102)
Felt energized	50% (51)	30% (31)	10% (11)	9% (9)	100% (102)
Made contacts with students from my own campus or from other campuses in the CIC	48% (49)	37% (37)	11% (13)	2% (3)	100% (102)
Gathered information about applying to graduate programs or continuing in academia	41% (39)	32% (31)	15% (14)	12% (12)	100% (96)
Discovered ideas about activities to implement on my campus	38% (38)	38% (38)	19% (19)	5% (6)	100% (101)
Felt more confident	33% (33)	43% (44)	15% (15)	9% (9)	100% (101)
Felt less isolated because I realized I was not the only woman in my discipline	32% (32)	37% (36)	20% (20)	11% (11)	100% (99)
Discovered opportunities to play leadership roles on my own campus regarding women in science, engineering, and mathematics	31% (32)	48% (49)	15% (15)	6% (6)	100% (102)
Became involved in organizations on my own campus related to women in science, engineering, or mathematics	27% (28)	32% (33)	16% (16)	25% (25)	100% (102)
Gained perspective about my department and campus by learning about other settings	26% (27)	45% (46)	18% (18)	11% (11)	100% (102)
Gained strategies for coping in my academic program	24% (25)	44% (45)	20% (20)	12% (12)	100% (102)
Gained perspective about my discipline by learning about other fields	21% (21)	49% (50)	20% (20)	10% (10)	100% (101)
Networked with faculty from my institution or from other institutions	18% (18)	31% (32)	25% (25)	26% (27)	100% (102)
Learned how to find employment either within or outside academia	18% (19)	36% (36)	29% (29)	17% (17)	100% (101)
Visited labs, private corporations, museums	17% (17)	34% (35)	14% (14)	35% (36)	100% (102)
Gathered information about potential careers in my field outside academia	6% (6)	35% (35)	33% (33)	26% (26)	100% (100)
Learned how to negotiate salary, benefits, and terms of employment	6% (6)	28% (29)	28% (28)	38% (39)	100% (102)
Networked with potential employers	2% (2)	6% (6)	25% (25)	67% (68)	100% (101)
Was exposed to women who share my concerns	2% (1)	65% (28)	31% (13)	2% (1)	100% (43)
Found a mentor	1% (1)	9% (9)	17% (17)	73% (73)	100% (100)

Table A-3: Follow-up activities held on home campuses after Leadership Conferences

Sites	Follow-up activities
1	Began a WISE group that held regular meetings Hosted special events: panel discussion on career alternatives; potluck dinners; mentoring workshop
2	Began student organization AWISE (1997) AWISE held monthly meetings and brought in local women from to speak on careers. Held AWISE annual forum (1998, 1999, and 2000)
3	Held own WISE conference with the similar format (over 200 in attendance) Held a WISE symposium sponsored by local firm. It was a great success because our attendance was higher than expected (approximately 180 participants). Judging from the evaluations, the participants thought the symposium was a valuable experience.
4	Have a well-established WISP program that coordinates monthly activities: Held sessions on mentoring, applying to grad school, doing a poster presentation, writing a research report, attending professional conferences. Hosted Annual women in science poster presentation day for women scientists Instituted lab tours and a mentoring program for undergrads. Hosted lunches for campus women
5	Held mini-symposium after the first conference. Created a campus-wide WISE group after second conference. Hosted CIC Leadership Conference one year. Discussed experiences at the conference and in our everyday life. Held conferences with the theme of balance between career, family, and school. Held a small conference called “Charting a Course to Success.”
6	Held a one-day leadership conference each spring with concurrent sessions on topics similar to those at the CIC conference (keynote speaker & balance panel). Target audience: Undergrads and grads.
7	Held a one-day WISE conference aimed at females, middle school to undergrad level, interested in SEM
8	Coordinated Spring 1998 student leadership conference entitled “What’s Your Combination? Combining Career and Personal Life.” (gathered female school students and assigned them a mentor) Hosted one-day event which focused on mentoring, graduate education, and networking included panel discussions, keynote speakers, and break-out groups.
9	Year 1- conducted a day-long conference, with keynote and local speakers “Skills for Success” Year 2 & 3- Conducted a series of workshops -“The WISE Strategies for Success” series (includes: applying to graduate schools, conflict resolution, succeeding in undergrad and grad school experiences; options after college with a degree in science; balancing family and career; conflict resolution, grant writing)
10	Helped another organization with their Women in Leadership Conference. Organized a seminar on negotiation skills. We wanted to have a “Next Step” conference with speakers, panels, and break-out groups addressing the transition to the next stage in education and career. Initiated a student WISE group and sponsored an all-day event (keynote and local talent, for more than 100 graduate, undergraduate, postdoctoral, and some high school students both women and men).
11	WISE organizes two annual women student conferences (one per semester): one geared toward undergrads and the other toward grad students.
12	Held a talk coinciding with the National Conference for Women in Higher Education. Held a one-day mini conference modeled on the first CIC leadership conference (70 participants)
13	Held all-day conference—“Strategies for Success: Advice from Women in Science and Engineering.” Includes a panel of women scientists, workshops for students on topics such as applying to graduate school Hope to improve networking and support between groups on campus concerned with women’s issues
14	Coordinated a luncheon of women faculty and academic staff in biology.

(Note: This table was created by combining survey responses from student participants and WISE liaisons.)

Table A-4: Recipients' ratings of benefits of Travel Grant Awards

Survey question: To what degree did you experience these benefits? (presented in descending order)

(N=165)

Benefit	<i>1 greatly</i>	<i>2 somewhat</i>	<i>3 minimally</i>	<i>4 not at all</i>	Total	No response
Networked with faculty and researchers in my field	72% (105)	20% (29)	6% (9)	1% (2)	100% (145)	(20)
Felt encouraged to continue in my field	66% (96)	25% (36)	8% (12)	1% (2)	100% (146)	(19)
Gained visibility for my work and me	62% (90)	32% (46)	6% (8)	1% (1)	100% (145)	(20)
Expanded my knowledge of the discipline	62% (90)	32% (46)	3% (5)	3% (4)	100% (145)	(20)
Networked with other students in my discipline	59% (85)	27% (39)	10% (15)	4% (6)	100% (145)	(20)
Increased my confidence in my ability to succeed in the field	55% (81)	38% (56)	4% (6)	2% (3)	100% (146)	(19)
Gathered ideas and/or data for further research	48% (69)	32% (47)	13% (19)	7% (10)	100% (145)	(20)
Learned how to create a poster and present it OR how to present a paper and field questions about it	46% (68)	30% (44)	9% (14)	15% (23)	100% (149)	(16)
Gained understanding about professional aspects of academic life	43% (63)	43% (63)	11% (16)	3% (5)	100% (147)	(18)
Attended a conference I could not otherwise afford	41% (62)	34% (52)	14% (21)	11% (16)	100% (151)	(14)
Increased my status among peers	34% (47)	38% (54)	19% (27)	10% (15)	100% (143)	(22)
Increased the probability of finding employment because of the contacts I made	29% (40)	46% (64)	14% (20)	11% (16)	100% (140)	(25)
Learned how to describe research in lay terms for the application	28% (42)	51% (76)	15% (22)	7% (10)	100% (150)	(15)
Increased my status with my advisor, other faculty, or department members	28% (40)	48% (69)	14% (20)	11% (16)	100% (145)	(20)
Increased the probability of receiving other grants	18% (25)	52% (72)	20% (27)	10% (14)	100% (143)	(27)
Learned how to write a grant proposal	6% (9)	40% (59)	28% (43)	26% (40)	100% (151)	(14)
Found a mentor	6% (9)	14% (20)	17% (24)	63% (91)	100% (144)	(21)