

**Distributed Mentor Project:  
Student Participant Feedback Survey Analyses for 1999**

February 2000

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This evaluation was funded by the National Science Foundation, grant #EIA 9813290, awarded to the  
Computing Research Association

## Table of Contents

Introduction .....	1
Demographics.....	2
Ethnicity .....	2
Institution .....	2
Major.....	2
Class standing and experience in CS&CE .....	2
Factors influencing choice to study CS&CE.....	3
Plans to stay in field of CS&CE .....	4
Undergraduate Experience .....	4
Informal, social interactions with people in CS&CE department.....	4
Self-rating relative to peers .....	5
Faculty role models.....	6
Plans and perceptions about graduate school .....	7
Graduate school plans .....	7
Factors encouraging/discouraging enrollment in a graduate program .....	7
Understanding of, preparation for, and commitment to graduate school .....	8
Impact of the DMP .....	9
Self-rating relative to CS&CE peers.....	9
Attitudes about graduate school .....	10
Outcomes wanted, gained, and valued .....	12
The DMP Experience .....	13
Overall ratings .....	13
Motivation to participate in the DMP .....	14
Initial preparations .....	15
The research project.....	16
Interaction with research community.....	19
Ratings of supervisor .....	20
Interaction with mentor .....	22
Social Activities.....	24
Suggestions for the program.....	25
Conclusion .....	25
Appendix A: 1998 and 1999 DMP Participants' Survey.....	26

# Analysis of 1999 DMP Student Feedback Survey

## Introduction

This report presents the data gathered from a survey that was administered by the University of Wisconsin – Madison's Learning through Evaluation, Adaptation, and Dissemination (LEAD) Center via email in the fall of 1999. The survey was sent to all of the eighteen students who participated in the Distributed Mentor Project (DMP) in the summer of 1999. Written for the administrators of the DMP, the purpose of this report is to provide feedback about the experience of the student participants that summer and the impact of this experience on their career choices. This information is valuable as the administrators determine the degree to which the DMP is functioning well and the degree to which it has an impact on its student participants as they make career choices regarding graduate school in Computer Science and Computer Engineering (CS&CE).

The LEAD Center has evaluated the program since its inception in 1994, using both qualitative (e.g. open-ended interviews) and quantitative methods (e.g. closed-ended surveys) and has produced three reports prior to this document. The first two reports draw heavily from interview data and provide a rich, contextual description of the experiences of the students in the DMP and its impact.<sup>1</sup> The last report provides a quantitative analysis of the survey results over three years and provides information on the rate at which the DMP participants appear to be enrolling in graduate school.<sup>2</sup> More detailed information about the experiences of the student participants in the DMP and its impact on these women can be gained from these reports.

The response rate to the survey was 100%, quite remarkable given that surveys that LEAD conducts typically have a response rate of 70%. In addition, the students were very complete in their responses: many answered all of the questions and offered explanations for many of their ratings. The survey, which appears in Appendix A, was long (64 questions) and consisted primarily of closed-ended questions. Many questions were "Likert-like," asking the students to rate their response on a five-point scale, and in many cases students were asked to explain their ratings. The only open-ended questions were "catch-alls" that asked the students to identify problems or offer suggestions for improving the DMP.<sup>3</sup>

The document is divided into five main parts. The first three parts provide information about the participants as they entered the program: their demographics, their undergraduate experience, and their attitudes toward graduate school. The last two parts outline issues related to the DMP. These parts describe the impact that the DMP has had on the student participants, with respect to changes in attitude toward computer science and graduate school, and discuss the various facets of the students' experience in the DMP, from their research project to their interactions with others.

### *Note about this document and the analysis:*

Three points are important to keep in mind as document is read. First, percentages, rather than counts, were used throughout the document because it allows for a more normalized view of the data both within this document and between the previous three reports produced by the LEAD Center about the DMP. It is important to note, however, that since there were only 18 participants, the percentages can be slightly misleading: a single response represents a fairly high percent of 6%. Second, in the analysis of the five-point "Likert-like" questions, responses of 1-2 were assumed to be negative, 3 was considered to be neutral, and responses of 4-5 were assumed to be positive. This clustering approach mirrors the explanations the students provided for their ratings. Third, almost all of the comments that students

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<sup>1</sup> Evaluation Reports #1 and #2

<sup>2</sup> Comprehensive Participants Survey Analysis for 1994-1997.

<sup>3</sup> This is not entirely true. One open-ended question asked students to identify how they learned about the DMP.

provided to explain their ratings or respond to open-ended questions are included in this document. Comments were removed only when they were illegible or incomprehensible. We placed a strong emphasis on presenting the student comments because this helps to "breathe life" into the highly-numeric data.

## Demographics

This section outlines some basic demographics of the 1999 DMP student participants: their ethnicity, the institution they came from, and their experience and interest in CS&CE. This information is important in that it provides one glimpse of students who are participating in the program.

### Ethnicity

Most (77%) of the DMP student participants were Caucasian, with 4 classifying themselves with a non-Caucasian ethnicity.<sup>4</sup> Two said that they were of Eastern European descent, one identified herself as an Asian American, and one identified herself as bi-racial (African-American/White).

### Institution

Each of the 18 DMP student participants came from a different institution. The distribution of students from the Carnegie types of institutions appears in the table below.<sup>5</sup> As in previous years, most students came from Doctoral and Research institutions.

**Table 1: Carnegie classification of institutions represented by DMP student participants**

<b>N=18</b>	
Bachelor I and II	22%
Masters I and II	6%
Doctoral I and II	33%
Research I and II	44%
Engineering	11%

### Major

All students but one were majoring in an area of computer science at the time they applied for the DMP. About half (56%) of the students entered their college years with the intent of studying CS&CE<sup>6</sup>. Of the eight students who did not choose to study CS&CE as incoming freshman:

- two were undecided as to their major,
- four planned to pursue the social and natural sciences areas (chemistry, economics, and physics)
- one planned to study in the humanities (elementary education)
- one had plans to pursue a business degree in international relations.

### Class standing and experience in CS&CE

Most of the DMP student participants came into the program with some experience in computer science. Almost all (94%) had taken at least five courses in computer science and engineering, and half had taken

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<sup>4</sup> One student did not provide an answer.

<sup>5</sup> These classifications were developed by the Carnegie Foundation for the Advancement of Teaching's, Classification of Institutions of Higher Education (1994 edition). This ranking system clusters institutions with similar purposes and programs. For example, Research I institutions emphasize research most heavily, whereas Bachelor I and II institutions are primarily four-year colleges without research programs.

<sup>6</sup> This figure includes two students who wrote "engineering."

10 or more courses in this area. Students were also fairly advanced in their undergraduate years with 78% being upperclassman at the time they participated. One student had actually graduated from her undergraduate institution at the time of her participation.

**Table 2: Number of courses (X) taken prior to DMP participation**

Q10 <sup>7</sup>	N=18
4 ≥ X ≥ 0	6%
9 ≥ X ≥ 5	44%
X ≥ 10	50%

**Table 3: Class standing**

Q8	N=18
Sophomore	22%
Junior	67%
Senior	11%

The student participants were quite successful in their undergraduate programs, as indicated by their overall grade point average: the average GPA on a 4-point scale was 3.74 (min=3.44, max=4.0). This average is exactly equal to the overall average GPA of the students who participated in 1994-1997. Over half (56%) of the students had GPAs greater than or equal of 3.8. Additionally, half of the participants entered the program with some research experience, generally with faculty in their department.

#### **Factors influencing choice to study CS&CE**

The DMP students were given a list from which to select their reasons for their choice of CS&CE as a major and were asked to identify the top four reasons that influenced their decision to study CS&CE. All students said that the one of factors in their choice to study CS&CE was that they find it enjoyable and interesting, and over half identified this as their top reason for pursuing CS&CE. This is significant because no other factor was selected with the same degree of support as a primary factor in the choice to study CS&CE, with the next top choice being "I am good at math and science" (at 18%). Almost all of the students also said that a factor in their decision to study CS&CE was that it is challenging and that they are good at it. Over half thought that CS&CE offered good career possibilities and good pay. A significant number of the students were influenced by teacher encouragement, or having relatives and/or friends in CS&CE, but these were not big reasons for their choice of study (as indicated by the low percent who selected these as top 4 reasons).

The 1999 student responses to this question were similar to those in the 1994-1997 cohort. The cohort of students selected the same top three choices most frequently as their reasons for studying CS&CE.

**Table 4: Reasons for studying CS&CE**

Q13	A factor	Top 4 reason	Top factor
CS&CE is enjoyable and interesting	100%	83%	59%
CS&CE is challenging	94%	78%	12%
I am good at math and science	89%	72%	18%
CS&CE affords many career possibilities	67%	44%	0%
A teacher encouraged me	56%	22%	6%

<sup>7</sup>"Q10" refers to Question 10 in the survey. This format is used throughout the report.

Q13	A factor	Top 4 reason	Top factor
I like the idea of being a computer scientist	56%	22%	0%
CS&CE jobs pay well	44%	22%	0%
A friend is in CS&CE	33%	6%	0%
A relative is in CS&CE	17%	6%	0%
My work experience	17%	11%	6%
Other: CS is just extremely relevant	6%	0%	0%
My employer encouraged me	0%	0%	0%
	N=18	N=18	N=17*

\*One respondent did not cite a top factor.

### Plans to stay in field of CS&CE

Most (72%) students had plans to stay in the field of computer science, although 22% (4 of 18) were undecided about whether they will stay in the field. Strangely, three of these four students felt they "fit" in CS&CE and had plans to attend graduate school in CS&CE within one year of graduation from their undergraduate institution. One person had no plans to stay in the CS&CE, which is likely due to the fact that she is not a CS&CE major.

Students were asked to identify the degree to which they "fit" into computer science. Most (72%) students agreed with this statement, with few having a strong agreement or disagreement.

**Table 5: Degree of "fit" in CS&CE**

Q15 (N=18)	AVE=3.82 ST DEV = .86
1=strongly disagree	0%
2	17%
3	11%
4	56%
5=strongly agree	17%

## Undergraduate Experience

We attempted to capture the undergraduate experience of the DMP students by asking them questions about the type and degree of involvement with other people (peers, graduate students and faculty) in the department. In particular, we focused on the ways in which these students viewed and interacted with faculty in their department.

### Informal, social interactions with people in CS&CE department

In order to gain a perspective on the degree to which the student participants interact socially with people in the CS&CE department, we asked students to rate the frequency of their interactions with undergraduate students, graduate students, and faculty. We broke this down further by male and female to also understand the degree to which the students interact with the genders. Not surprisingly, the students interact most frequently with undergraduate students, both male and female. They appear to interact most frequently with male undergraduates and this is likely related to the fact that CS&CE is a male-dominated area.

**Table 6: Frequency of informal, social conversations with people in CS&CE**

Q29 Type of person (N=18)	1=not at all	2	3	4	5 = very freq	NA*
Undergraduate students -- Male			28%	17%	56%	
Undergraduate students -- Female	6%	17%	17%	28%	33%	
Graduate students -- Male	28%	11%	17%	17%		28%
Graduate students -- Female	28%	28%		17%		28%
Faculty -- Male	28%	33%	17%	11%	11%	
Faculty -- Female	33%	11%	28%	11%	11%	6%

\*NA=Not applicable

The student participants appear to be, on average, moderately involved in their CS&CE departments and more or less feel a part of their departments. Not surprisingly, involvement in the department is correlated with feeling part of the department, as the table below indicates. Half of the students report being involved to very involved with the department (giving a 4 or 5 rating), and very few reported having little involvement (1-2 rating). Forty-five percent of the students feel a part of their department, while a little more than half feel "somewhat" to "not at all" a part of their department (1-3 response).

**Table 7: Degree to which students feel part of the department and the degree to which students are involved in the department**

N=18	Q35. Degree of involvement in department					
Q34. Degree to which feel part of department	1=not at all	2	3	4	5 = very	N (%)
1=not at all						0 (0%)
2		33%	67%			6 (33%)
3			50%	50%		4 (22%)
4			33%	57%		3 (17%)
5				20%	80%	5 (28%)
Percent	0%	11%	39%	28%	22%	18

### Self-rating relative to peers

We asked students to rate their pre-program preparation, ability, and interest relative to their peers in CS&CE.<sup>8</sup> On average, students rated themselves on par with their peers with respect to their preparation, and slightly higher than their peers with respect to their ability and interest in CS&CE. While slightly less than 1/3<sup>rd</sup> of the student participants gave a low rating of their preparation, almost no student gave themselves a low rating in ability and interest. In fact, a little over half of the students gave high to very high ratings of their ability and interest in CS&CE relative to their peers.

**Table 8: Self-rating, relative to peers**

Q30 (N=17*)	1=Low	2	3	4	5=very high	Ave.	St. Dev.
Preparation	6%	24%	35%	30%	6%	3.06	1.03
Ability			47%	41%	12%	3.65	.70
Interest		6%	35%	41%	18%	3.71	.85

\* One person didn't answer this question

The low self-rating in preparation may be linked to the choice of incoming major. Half (6 of 12) of the

<sup>8</sup> Since this survey was conducted following their participation, the students' ratings are estimates of their attitudes prior to the program.

students who entered college planning to study math-based disciplines<sup>9</sup> such as CS&CE and physics rated themselves high to very high relative to their peers whereas all (four) of those students in non-math based disciplines (chemistry, economics, education, and industrial relations) rated themselves low to very low in preparation relative to their peers. It is possible that the students who switched majors to CS&CE from a less math-intensive discipline may feel a need to "catch up."

### Faculty role models

The majority of student participants were able to identify role models among the faculty in their CS&CE department. Two-thirds could identify a female faculty role model (with 1 person of the 18 saying there are no female faculty at her institution) and 78% could identify a male faculty role model.

Almost all (89%) reported that a faculty member in the CS&CE had taken an interest in them, and 15 provided descriptions of the type of interest that was shown. This interest on the part of the faculty member has been in: providing advice for classes and graduate school, providing encouragement for continuing in computer science and applying for the DMP, and providing work on a research project or as a grader. Six students (all of whom attended Research or Doctoral Institutions) said that they had done research with faculty in their department. The following table presents the descriptions that students provided of the types of interest faculty at their undergraduate institution have shown in them.

**Table 9: Type of interest shown by a faculty member at undergraduate institution**

<b>Q30 (N=15)</b>	
<b>Work as researcher or grader</b>	
	<i>After working a semester as a grader, I was hired as an undergraduate research assistant (for a female prof). I was recommended as a grader by a female prof. I was also asked to be president of the local chapter of ACM by a female prof.</i>
	<i>He gave me the privilege to work on a research project he was doing, to expand my knowledge in software engineering. He is regularly commending my achievements, and encouraging me both to go to grad school and to continue doing good job on the project.</i>
	<i>He got me involved in his research.</i>
	<i>I was recruited for an undergraduate research project, and was encouraged to apply for the Distributed Mentor Project.</i>
	<i>Providing encouragement through offering research projects and undergraduate teaching assistantships.</i>
	<i>Talking with me about my classes, getting me involved in research projects.</i>
<b>Encouragement</b>	
	<i>He was the one that encouraged me to apply for the DMP program. He's also encouraged me to attend graduate school, TA for his class, and to do a senior honors thesis. We always end up talking for a while when I come to his office or advice.</i>
	<i>Help, advice, encouragement</i>
	<i>I have gotten lots of encouragement from all of the faculty here when I talk about grad school and computer science. My advisor has offered to write recommendations and has been very encouraging all along in my undergraduate career. He has offered lots of advice and support. Also, another faculty member was the one who suggested DMP to me. Her encouragement and suggestions to apply for DMP showed me that she has taken an interest in my progress.</i>
	<i>My advisor (also a woman) has always encouraged me told me about opportunities such as CRA DMP... and my operating systems professor has nominated me for an award which was flattering and encouraging.</i>

<sup>9</sup> Math-based discipline is used here to represent those disciplines that generally require the full sequence of calculus to get a degree.



<b>Q30 (N=15)</b>	
	<i>Asked about my academic plans, encouraged me to take more CS courses</i>
	<i>They got me to apply for the CRA DMP. They encouraged me to give a talk to the department about my experiences. They have me represent the CS students when talking to potential new faculty.</i>
<b>Advice</b>	
	<i>She advised me in what classes to take and how to proceed in applying to graduate school.</i>
	<i>Talked to me about my career plans based on my undergraduate success.</i>
	<i>They followed my summer experiences and have taken an interest in my graduate school applications including what I am looking for in a school and what areas I am interested in.</i>

## Plans and perceptions about graduate school

In this section, we outline the plans that the DMP student participants had for graduate school and the factors that encourage or discourage them from enrolling in a graduate program in CS&CE.

### Graduate school plans

All but one of the student participants were still enrolled as undergraduates at the time the survey was conducted and many (72%) of these students had plans to attend graduate school in CS&CE. The one student who had earned her B.S. was enrolled in graduate school in CS&CE. Most (83%) of the students had plans to attend or were attending graduate school in some area.

**Table 10: Post-Baccalaureate plans**

<b>Q17, Q18</b>	<b>N=18</b>
Attend graduate school in CS&CE with 1 year of graduation	61%
Attend graduate school in CS&CE eventually, but work first	11%
Currently attending graduate school in CS&CE	6%
Attend graduate school in another area, not CS&CE	6%
Undecided about graduate school plans, will work in CS&CE	11%
No graduate school plans, will work in CS&CE	6%

The table below lists the highest degree the students plan to pursue. Eighty-four percent of the student planned to pursue an advanced degree and an impressive 50% planned to pursue PhDs.

**Table 11: Highest degree plans**

<b>Q20</b>	<b>N=18</b>
BS, no grad school plans	6%
Undecided	11%
MS	17%
PhD	50%
MS or PhD	17%

### Factors encouraging/discouraging enrollment in a graduate program

The DMP students were asked to identify from a list those factors that encouraged and/or discouraged them to enroll in graduate school in CS&CE. All students selected factors that encouraged them to enroll in graduate school, and fifteen student participants cited factors that were discouraging. Most (78%) students cited their success as undergraduates in CS&CE, their advisor/mentor at the undergraduate

institution and the DMP experience as encouragers for them to enroll in graduate school. Seventy-two percent said that their career goals were an encouragement for them to pursue graduate studies.

The top two factors that discouraged student participants from attending graduate school in CS&CE were "career goals" and "technical interests." It is likely this means that the students' career goals and interests conflict or are not served by, attendance in graduate school in CS&CE. Four students cited the difficulty balancing graduate school with outside interests, including family.

**Table 12: Factors encouraging/discouraging enrollment in CS&CE graduate school**

Q21 and Q22	Enc	Disc
Level of success in undergraduate CS&CE	78%	13%
Advisor/mentor at undergraduate institution	78%	
DMP experience	78%	
Career goals	72%	40%
Technical interests	50%	33%
Extra-curricular activity at undergraduate institution (e.g. research project)	44%	
Work experience	39%	
Influence of a family member	33%	7%
Experience/mentor during my high school years or earlier	6%	7%
Other: "The graduate students I met while doing the DMP have been a great source of information and support for me in my graduate school plans"	6%	
Other: Difficulty balancing family and graduate school		20%
Other: Tough application process		7%
Other: Difficulty balancing outside interests with graduate school		7%
Other: Can make more money in industry		7%
	N=18	N=15

**Understanding of, preparation for, and commitment to graduate school**

We asked students to rate the degree to which they understood, felt prepared for, and were committed to graduate school prior to the DMP.<sup>10</sup> Most (72%) of the student participants felt that they had little or no understanding of graduate school prior to the program, many (50%) felt that they were not well-prepared for graduate school. None of the students felt that they had a good understanding of graduate school, and only one student felt she was well-prepared for graduate school. Less than 1/3<sup>rd</sup> of the students said that they were positively committed to graduate school, and 23% felt very little commitment to graduate school.

**Table 13: Understanding, preparation, and commitment to graduate school**

Q23, Q25, Q27 (N=18)	0*	1= not at all	2	3	4	5= very	Ave	St. dev.
Understand grad school		11%	61%	28%			2.16	.62
Prepared for grad school		11%	39%	44%	6%		2.44	.78
Committed to grad school	17%	6%	17%	33%	11%	17%	3.2**	1.21

\*0=I hadn't thought about it (applies only to the question on commitment)

\*\*Average includes only responses from 1 to 5. Here, N=15

<sup>10</sup> Since this survey was conducted following their participation, the students' ratings are estimates of their attitudes prior to the program.

## Impact of the DMP

We looked at the impact of the DMP in multiple ways, both from quantitative data and from comments students volunteered to explain their ratings. We asked students to rate themselves pre- and post-DMP in following areas:

- preparation for, interest in, and abilities relative to their peers in CS&CE
- understanding of, preparation for, and commitment to graduate school in CS&CE
- specific outcomes of the program

Note that since the students were given one survey and that survey was administered following the program, the pre-program ratings reflect students' post-program perceptions of their incoming attitudes.

Generally, over half of the student participants reported gains in their self-rating in preparation for, interest and ability in CS&CE. No student reported a loss in these areas. Most students reported a greater understanding of and preparation for graduate school and many reported being more committed to pursuing graduate studies in CS&CE. Many students left the program with professional contacts and a letter of reference from their mentor, with improved research skills, and a better understanding of how to apply to graduate school.

### Self-rating relative to CS&CE peers

To measure a change in the student participants' self-rating in their preparation for, ability and interest in CS&CE, we asked students to provide before and after ratings of the program. For the analysis of their pre-program ratings, please see the section in the "Undergraduate Experience" under this same title.

The table below shows the distribution, average and standard deviation of the "before" and "after" responses to these questions. As the table indicates, students on average rated themselves higher post-program than pre-program in all three areas. This is also demonstrated in the after responses, which cluster around the high end of the scale. In fact, over three-fourths of the students rated themselves high in preparation, ability and interest relative to their peers in their post-program ratings.

**Table 14: Changes in ratings relative to CS&CE peers (View 1)**

Q30, Q31 (N=17*)	Before DMP	After DMP
Preparation for CS&CE	Ave=3.06 (StDev=1.03)	Ave=4 (StDev=.71)
1=low	6%	
2	24%	
3	35%	24%
4	30%	53%
5=very high	6%	24%
Ability in CS&CE	Ave=3.65 (StDev=.70)	Ave=4.17 (StDev=.53)
1=low		
2		
3	47%	6%
4	41%	71%
5=very high	12%	24%
Interest in CS&CE	Ave=3.71 (StDev=.85)	Ave=4.42 (StDev=.61)
1=low		
2	6%	
3	35%	6%
4	41%	47%

Q30, Q31 (N=17*)	Before DMP	After DMP
5=very high	18%	47%

\*One person did not provide a response to this question

We also calculated the differences in the before and after ratings by subtracting the "before" rating from the "after" rating for each student. This approach provides a glimpse into the change reported by each participant in the program. The table below shows the distribution of differences and the average difference with standard deviation.

**Table 15: Changes in ratings relative to CS&CE peers (View 2)**

Q30,Q31 (N=17)	0 points	1 point	2 points	Ave	St Dev	N=*
Preparation for CS&CE	25%	50%	25%	1	.73	16
Ability in CS&CE	47%	47%	7%	.6	.63	15
Interest in CS&CE	36%	43%	21%	.86	.77	14

\*N changes for each area because we removed those students who rated themselves a 5 on the before question, reasoning that they cannot rate themselves higher and artificially deflate the scale. Had there been negative changes in ratings, we would not have removed these students from this table.

No student participant reported a decrease in their preparation, ability and interest in CS&CE, although a quarter to a half stayed at the same rating. Seventy-five percent of the student participants reported an increase in their preparation for CS&CE. Sixty-five percent reported an increased interest in CS&CE relative to their peers, which results in 94% of the student participants feeling that they have a greater interest in CS&CE than their peers. With respect to ability, about half the students reported no change and slightly more than half reported some change. Following the program, 94% of the students considered themselves to be higher in ability relative to their peers.

One student provided insight into her gains in this area:

*I am extremely pleased with all that I have learned and accomplished. Being a co-author was really exciting for me. I have now given oral presentations to my elders, which has bolstered my confidence level in public speaking. I now have a deeper appreciation for my courses.*

### **Attitudes about graduate school**

Students were asked to list "before" and "after" responses about their understanding of, preparation, and commitment to graduate school in CS&CE. For a discussion of the pre-program attitudes, please see the previous section under the title, "Plans and perceptions toward graduate school."

As the table below indicates, most student participants rated their understanding of, preparation for, and commitment to graduate school in CS&CE higher after the program. The average responses indicate this shift: the average understanding rating increased from 2.17 to 4.11, the average preparation rating went from 2.44 to 4.0, and the average commitment went from 3.22 to 4.11. The increase in understanding and preparation is also apparent from looking at the pre- and post-program distribution of responses. The "before" responses cluster around the 2 and 3 ratings, while the "after" responses cluster around the 4 ratings. This change is less dramatic with respect to commitment to graduate school, although many (72%) of the students rated themselves as committed to school after the program (compared to 39% -- almost double!) before the program.

**Table 16: Changes in attitudes about graduate school in CS&CE (View 1)**

Q23-28 (N=18)	Before DMP	After DMP
Understanding of graduate school	Ave=2.17, StDev=.62	Ave=4.11, StDev=.47

Q23-28 (N=18)	Before DMP	After DMP
1=no understanding	11%	
2	61%	
3	28%	6%
4		78%
5=a thorough understanding		17%
Preparation for graduate school	Ave=2.44, StDev=.78	Ave=4, StDev=.59
1=not prepared at all	11%	
2	39%	
3	44%	17%
4	6%	67%
5=very prepared		17%
Commitment to graduate school	Ave=3.2, StDev=1.21*	Ave=4.11, StDev=1.07
0=hadn't thought about it	17%	
1=not considering it	6%	
2	17%	11%
3	33%	17%
4	22%	22%
5=very committed	17%	50%

\*Average and standard deviation for this question are computed only with those responses of 1, 2, 3, 4, or 5.

As in the previous section, we also calculated the differences in the "before" and "after" ratings by subtracting the "before" rating from the "after" rating for each student. The table below shows the distribution of differences and the average difference with standard deviation.

**Table 17: Changes in attitudes about graduate school in CS&CE (View 2)**

N=17	-2	0	1	2	3	Ave	St Dev	N=
Understanding of			22%	61%	17%	1.94	.64	18
Preparation for		6%	39%	50%	6%	1.56	.70	18
Commitment to	6%	6%	17%	44%	17%	1.56	.70	15*

\*N does not include those students who had not thought about graduate school prior to the program.

Every single student participant listed some gain in their understanding of graduate school, with the lowest gain being 1 point and the highest being 3 points. Most (78%) of the students reported at least a 2 point gain in their understanding of graduate school in CS&CE. Students reported only slightly less impressive gains in their preparation for graduate school. All but one student listed some gain in their preparation, with the lowest gain being 1 point and the highest being 3 points. Just over half (56%) of the students reported at least a 2 point gain in their preparation of graduate school in CS&CE. All but two students listed some gain in their commitment to graduate school. One student noted a loss in her commitment to graduate school, but did not explain this loss in her survey and her responses indicate a positive experience in the DMP. (It is possible that her experience, although positive, led her to realize that graduate school wasn't for her.) The student who reported "no gain" had already listed herself as "very committed" to graduate school. Many (61%) students reported at least a 2 point gain in their commitment to graduate school.

Some of the student comments provide some insight into these numbers.

*That was my first exposure to research, and I not only learned a lot, but I end up with something well working and useful for the project I worked on. I learned how to work for resources, revive my self-*

*confidence, and I ENJOYED what I did. I have never before realized how much I would like to do research and work with people who are doing research, and I believe this experience came at the right moment of my life to give me the right direction for my future goals.*

*The experience was very valuable to me at least in part because it helped me decide that I did indeed want to go to graduate school. I wasn't sure if I would choose industry or academia following my undergraduate degree, but now I am certain.*

*I knew nothing about graduate school before, and now I know more about it, so I can make a more educated decision about whether or not I want to go. It was also really good to go to another institution. I was surprised to discover that they have a lot more female CS professors at [at my mentor's institution] than they do at [my institution]. That definitely gave me a different perspective on women in CS.*

*I was able to experience first-hand the day-to-day life of a CS researcher and have a better idea of what the world of academia is about.*

### **Outcomes wanted, gained, and valued**

Besides an improved self-rating with respect to their peers and an increased understanding of, preparation for, and commitment to graduate school, we asked students to identify specific outcomes that they gained from the program. We gave students a list of outcomes from which they could identify those that they wanted, gained, and/or valued in the program. Students listed outcomes similar to those they listed in the other sections of the survey (see "The DMP experience: Motivation to participate in the DMP"): to develop better research skills and to learn about career opportunities and options. The responses indicated that students learned more than what they originally wanted or expected. Most gained a letter or reference and a professional contact. Many did develop better research skills, and learned about graduate school (how to apply, select, and succeed in one), and did learn about career opportunities and options. The students valued most the research skills and information on applying to graduate school.

**Table 18: Outcomes that students wanted, actually gained, and valued the most\***

<b>Q39 (N=18)</b>	<b>Wanted</b>	<b>Gained</b>	<b>Valued</b>
A letter of reference	50%	78%	17%
Professional contacts	44%	72%	17%
<b>Information on how to:</b>			
Develop better research skills	78%	89%	56%
Succeed in graduate school	61%	67%	22%
Select a graduate school	50%	61%	11%
Find other research opportunities	39%	39%	17%
Select a thesis/research topic	28%	33%	6%
Balance work and personal life	39%	33%	6%
Balance family and work	28%	22%	
Write and develop a resume	17%	6%	
Deal with departmental politics	11%	6%	
Deal with sexual harassment	17%	6%	
Conduct a job search	6%		
<b>Information on:</b>			
Applying to graduate school	56%	72%	44%
Career opportunities and options	72%	61%	28%
Building self-confidence	67%	56%	33%
Fellowship opportunities	50%	50%	17%

Q39 (N=18)	Wanted	Gained	Valued
Publishing, making presentations	33%	50%	17%
Successful interviewing	11%	6%	
Other: friendship with people worked with		6%	6%
Other: research process and the academic world		6%	

\*Table sorted by aspect gained

## The DMP Experience

In this section, we outline the various elements that the students experienced in the DMP. We begin with a discussion of their overall rating of the program, and then move to various facets of the program such as their motivation to participate, preparation for the program, the research project, interaction with the research team, interaction with their mentor, and finally, the social life that students experienced.

All students reported having a positive experience in the DMP. While a few students some had difficulties with parts of the program, most students enjoyed their research project and their interactions with their mentor.

### Overall ratings

All of the student participants rated their DMP experience highly. When we asked students to rate their satisfaction with their overall experience in the DMP, the ratings were evenly divided between 4 and 5 (=very satisfied), for an average of 4.5. A review of students' overall responses to the surveys revealed that students were pleased with their participation in the program and felt that they gained much from it. It is important to note that although all students gave the program high ratings, a few indicated (in various sections of the survey) that they had some negative experiences.

Many student participants provided explanations for their rating of the program. Many cited various aspects of the program that made their experience successful, such as an interesting and valued research project, learning new information, and working with different people.

*I enjoyed the chance to get to work on a research project. I also got to attend a conference during the summer where I met a lot of different people doing research in the same area.*

*I learned a lot, produced good results, had fun, and met awesome people.*

*I kind of had the time of my life during the DMP project. I was lucky to have a very attentive mentor, I learned a lot and gain back my confidence and desire to do my best and work on myself and my development in the realm of CS. I was able to see what grad school is about, to meet many famous professors and in general, many interesting and challenging people. I realized that this is an atmosphere and circle of bright people I'd love to work with, and also it's so cool and fulfilling to go and research things that probably no one before went through! I saw the world of grad school and CS in another, far more challenging light. I am really happy I made this choice, as I believe it'd be a guiding hint for the path of my life.*

*The freedom of independent study was complemented perfectly with the instruction and guidance of an experienced researcher and professor.*

*I had an excellent experience. Very helpful and knowledgeable mentor, and the research-lab mentors were welcoming and supportive.*

*The DMP was a wonderful experience! I met lots of great people, and learned a ton!*

In addition, the students' unsolicited comments also provide insight as to the benefit of the program.

*I think that the continuation of this program is extremely beneficial in encouraging young women to continue in graduate school. I also believe that it is beneficial to provide young women with female mentors in computer science. I hope that in the future, more young women would have a chance to participate in the program.*

*It was an all-positive experience for me!!!*

*Just want to say thank you for allowing me to participate in the mentorship program. I came in with only cursory knowledge of computers and came out understanding and appreciating many new concepts and learned a lot about graduate school life and work.*

*Everything was great. I had a wonderful summer and am now applying for graduate school in the fall.*

*This was a wonderful experience -- thank you!*

**Motivation to participate in the DMP**

All of the students learned about the program through "word of mouth" sources. Two-thirds of the student participants received information from a faculty member or advisor in their department.

**Table 19: How students learned about the DMP**

Q36	N=18
Faculty/Advisor	67%
Former participant	11%
Employer	6%
Relative	6%
Teaching assistant	6%
Departmental email	6%
Word of mouth	6%

Note: percentages do not total 100% because students provided multiple responses.

One student commented that the DMP should more actively recruit female undergraduates:

*I think many undergraduates are interested in research but do not get the message about the CRA mentor research opportunity. Probably it depends on every University and our advisors, but I expect you can know better how the project could be better advertised.*

All students cited multiple reasons for their participation in the DMP. Their responses further support the findings from the previous years' evaluations: students wanted to do research in computer science and learn whether graduate school was right for them. Many anticipated that their participation would strengthen their application for graduate school. The opportunity to have paid summer work was important as well. Students also checked that it would be an opportunity to work with a female academic researcher, but it is unclear whether the gender of the researcher was important.

**Table 20: Motivation to participate in the DMP**



Q37 (N=18)	Reason	Top Reason
It would give me the opportunity to do research in computer science	100%	44%
It would give me an opportunity to learn about graduate school to see if it was right for me.	83%	17%
It would be paid summer work	78%	
It would strengthen my application for graduate school	78%	
It would give me the opportunity to work with a female academic researcher	72%	6%
It would give me the opportunity to go to a different institution	44%	
Other: Weather	6%	
Other: Mentorship, regardless of gender of mentor	6%	6%

### Initial preparations

The previous evaluations of the DMP have outlined the problems students faced if their project wasn't clearly outlined (or even ready) for them and if they didn't know the protocol for when and how to contact their mentor. To determine whether students felt that they knew what was expected of them, we asked students whether various aspects of their project and their mentor interactions as well as of the work setting were prepared for them. The results appear in the table below.

**Table 21: Initial preparations**

Q40	N=18
<b>Explained to you:</b>	
The goals and expectations for your research project	83%
How this project was related to your mentors' research	83%
Who to ask when you have questions	100%
When and how to contact your mentor when you have questions for her	94%
<b>Prepared for you:</b>	
Your work setting	94%
Identifications for using the services of the department	94%
Identifications for using the services of the university	67%
A research project	89%

As in previous years of the DMP, problems did arise for those students who did not know the goals and expectations for their research project and/or when no project was set up for them. Two of these students reported having an extremely frustrating start to their DMP experience. Another student reported that her mentor wasn't around often, but turned it into a positive part of the program by saying she gained an understanding of the value of working independently. One student said that she was never told initially how her project was related to her mentor's research, or had a research project set up at all characterized her project as "busywork."

One problem that occurred for a few students each year was the difficulty of finding housing in the area. These students generally had run-ins with the administrative body of the university who didn't know quite what to do with a temporary visitor who was not classified as a student. This year, 77% of the students were able to find housing with little or no difficulty, and 23% had some difficulty. The following quote illustrates the problems some students face as they seek housing:

*I think that it is really tough to be at a school for the summer where you don't have student status. Everyone has a hard time knowing where you fit in. It's tough to find housing and if given campus*

*housing, they charge you the same but treat you like you're an anomaly (the housing departments). It seems like the REU students have an easier time with the student status issue, and I guess that there are generally more of them, but maybe at schools where there are also REU students (in any program), it would be nice to be lumped in a group with them a bit more. I feel like the mentors didn't really know how little was done for us in the housing department, so they might appreciate knowing that in general, we're fending for ourselves, so any helpful extras they might be able to loan to us for the summer would be appreciated (i.e. an extra phone, cooking utensils... stuff like that). Maybe if mentors have that stuff, they could offer it to the DMP participant (it's silly to buy stuff like that when people have extras...)*

### **The research project**

As noted earlier, for many students the research project was one of their primary reasons for participating in the DMP. Most students seem to enjoy their research project and gave high ratings to the overall value of their project.

**Table 22: Value of research experience**

<b>Q42 (N=18)</b>	<b>Ave=4.56</b>
1=not at all valuable	
2	
3	6%
4	33%
5=very valuable	61%

While most students reported having a positive research experience, a few students mentioned problems with their research program. We put these first to illustrate the importance of a well-structured research project and of providing feedback regularly to students. Two students gave high ratings to the value of the research experience, but were frustrated initially with their projects. Both felt that they were thrown into their project with little or no guidance. The situation for both of these students was corrected before the end of the program. Both situations indicate that two extremely important parts of the DMP: having a project that is in line with the students' background and having the proper support for the students as they encounter the unfamiliar territory of working independently and new material.

*I felt stranded in the first few weeks with a project that seemed both over my head in the sense of practical how-do-I-set-up-and-use-this-environment know-how and irrelevant to university research. I felt that I had been given a project to occupy me and left to fend for myself. I felt that although my mentors cared about me, they didn't particularly care about the project per se and had low expectations for what I would do during my time there. Switching projects made a night and day difference. Whereas being left alone in a confusing often-crashing environment is abandonment, being left alone on an interesting and navigable project is freedom. I liked my mentors very much as people, but would have appreciated more attention paid to what project I was given.*

*I felt that I was thrown into a project that took me forever to figure out just what it was I was supposed to be doing. It was NEVER explained to me exactly what or how I was supposed to do my part until another member of the lab group checked in on me one day. When I confronted my mentor, she didn't seem to understand how lost I was and that the person assigned to help me wasn't helping me much. Everything was much, much better once someone else in the group started helping me, but for the first four weeks, I felt extremely stupid and depressed that I could not understand the task before me. After someone else started helping me, I felt much better about my coding ability. I would have suggested to my mentor that something more structured be given to me at start. And to have the*

*person assigned to help me understand that I am not a fifth year grad student, but an undergrad that cannot possibly understand how to debug a [complicated program].*

Many students provided positive comments about their research experience. These students said that they learned new topics, developed research skills, improved their own programming skills, and they left with a product.

*It helped introduce me to AI and methods therein, gave me more programming experience, and produced good results.*

*I learned a lot of topics I hadn't studied much before. I also learned useful skills like using UNIX OS, and I gained insights on research, paper writing and presentation techniques.*

*Although I was able to work as an individual on my research this summer, my work contributed to accomplishing a team goal.*

*I got to implement and improve upon an algorithm created by one of the graduate students. The project was small enough that I could feel like I completed something, but I could see how it fit with the larger areas of my mentor's work.*

A few students said that they developed fundamental research skills that were important, though difficult, to learn.

*I learned more about conducting research and how you can't expect someone to "hold your hand" at every step. To keep your research moving, you have to take the initiative to learn what you need to learn, do what you need to do, and get yourself unstuck when you get stuck.*

*The research we were working on was interesting and allowed us to explore an area that often overlooked. Unfortunately the project was often frustrating due to the inadequacies of the tools we were using. This frustration was valuable and helped me learn how to work around large problems. Finally, the project is a very long term one, while we were able to meet most of the goals set forth at the beginning of the summer, the entire project continues.*

#### *Characteristics and preparation for the research project*

Similar to previous years, most (83%) of the students had to do some background reading before they could begin their project. Two said that they had the necessary preparation to begin immediately, and one said that she never gained the necessary preparation to do her project. Many students described their project as "like real research, in that there is no known solution to the problem." Three (or 17%) described their project as like a "large class project," and one said that it was like "busywork (routinely applied a 'canned procedure', and had no real intellectual challenge."

Most students found their project to be challenging and most felt that the work they did was valued by their mentor. One student who said her project was not challenging also commented that this was likely due to time constraints -- she participated in the program for less than 10 weeks.

**Table 23: Project characteristics**

<b>Q46</b>	<b>N=18</b>
Challenging to you intellectually	89%
Valued by your mentor and/or members of her research team	83%
Related to mentor's research	67%

Structured in a way that it could be completed during the DMP	56%
In your area of interest, if you had one	56%

Two-thirds of the students felt that their project was related to their mentor's research and slightly more than half felt the project was structured in a way that it could be completed and was in their area of interest. Many of the students who said the project couldn't be finished in 10 weeks provided insight to this issue: four of these described their project as large, like an open research question; three said they were eventually able to finish the project – one as an independent study, and one after they changed the project.

One student wasn't happy with her project area.

*I think that the mentors should have something formal posted somewhere to give us, the students, an idea of what we are going to do -- Especially if we are given a choice. When I picked my topic, I had no clue what it involved. It was just a familiar term. In retrospect, I would not have picked it from the value lists of research topics listed on my mentor's home page. Once I picked my topic, I felt that I was stuck to complete it. I guess I really should have been more assertive on my end.*

#### *Finishing the project*

Most (72%) students were able to complete their project. Four of the five students who did not finish their project commented that their project was large and/or was exploring new territory.

*My project really went outside of the norm of what people were doing in the field, and besides that the field was new to me. I think it was new to my advisor too, since she was not able to answer a lot of the questions I had.*

*The project is an open research topic. We succeeded in implementing more functionality than was previously considered possible, but the most difficult cases were left untouched.*

*Did what we could, but came up with no definitive conclusion within the ten weeks. The results we got need to be further examined.*

*It was a start on a rather large project, and was left in a "pick-up ready" state*

*The answer to this question should really be yes and no. After some initial discussions with my mentor she decided to give me the freedom to take my research in whatever direction I decided (within reason). Although, I did finish a lot of the things I set out to accomplish there are still some more things I would like to continue to work with. I still have access to my computer accounts at my mentor's institution to allow me to continue my work.*

Most (13 or 72%) students wrote up their project and/or presented the project. Twelve of these 13 students explained what they did.

**Table 24: Presenting the project**

<b>Q48</b>	<b>N=12</b>
Gave a presentation	50%
Wrote a report or co-authored a paper	42%
Prepared a web page	25%

**Interaction with research community**

The survey responses indicate that the students worked mainly by themselves with most receiving weekly guidance from their supervisor who was either their mentor (for 10 a students) or a graduate student assigned by their mentor (for 8 students). A few (2) said that they did not see their mentor often, as indicated by a 1-2 rating.

**Table 25: Degree of interaction with others**

Q49	N=18
1=worked primarily alone	28%
2	22%
3	17%
4	28%
5=worked side-by-side with others	6%

**Table 26: Interaction with people**

Q52	1= almost never	2	3	4	5 = almost daily	N=
Mentor as supervisor		10%	30%	20%	40%	10
Graduate student as supervisor	14%		14%	14%	57%	7*
Members of the research team		25%	13%	13%	38%	16

\* one student didn't provide a response

Previous evaluations indicated that it was important that students feel as if they are contributing members of the research team. Forty-two percent of the student participants felt that they were valuable members of the team, 42% felt that they were somewhat valuable, and 18% said that they were not considered very valuable to the team. This distribution indicates a variance in the students' perceptions of the value of their work to the research team and this is reflected in their comments.

One person who gave a low rating said that she felt that she actually contributed *negatively* to the research group.

*In order to start my project, it took almost a week for one of the members of my research team to fix the [application] to produce the stats I needed. And this was during the fifth week of the program. Then what took me the next five weeks to do, it took the member of my group that was helping me only 30 minutes to write the same code. So I felt like I contributed negatively to the group since I felt like I was more of a bother than an active member.*

A few (4 of the 18) students said that they worked independently of the research team, and had no interactions with anyone but their mentor.

*My project was not really very related to anything anyone else in the group was doing. My mentor's work and some work done by previous DMP students was sort of related, but I didn't even really feel like I was part of a research team.*

*My work was completely independent of the research team. I never interacted with anyone else but my mentor.*

*The project we were working on was completely independent of other active research projects. So we*

*had no interaction with the other members of her research team.*

*I liked the fact that my mentor gave me a lot of freedom to pursue my own ideas. However I did feel rather isolated a lot of the time, although most of this was due to circumstances beyond her control.*

Others (9 of 18) described a variety of ways in which they felt valued, appreciated, and/or liked by members of the research team.

*My work was necessary, but not as "new" as other members' work since I had the least experience, was the youngest, and was new to the project.*

*Everyone seemed to appreciate what I was doing, but I felt like it wasn't "real" research.*

*I felt valued, but not really part of the team.*

*I was included in meetings and discussions along with the PhD students in the research group and I gave a presentation of my work to the group at the end of the summer. However outside of these meetings I didn't have much contact with the group.*

*I felt very emotionally supported and made friends with many of the other graduate student; in that sense I felt very valued. As far as the projects I worked on were concerned, I recognized that no one had a stake in how or even whether they were done; as far as research went, I realized that I was irrelevant.*

*Great personal interaction; my research was used even after I left.*

*I think the people I worked with directly appreciated what I was doing.*

*I was included in all of the research meetings and my research was a piece of their overall project.*

*My mentor and I worked on the project together. I felt almost like an equal partner (with MUCH less knowledge and background of course).*

### **Ratings of supervisor**

As stated in the previous section, the student participants were supervised either by their mentor or by a graduate student assigned by their mentor. Many students seemed satisfied with their supervisor, whether this person was their mentor or a graduate student.

**Table 27: Satisfaction with supervisor**

<b>Q51</b>	<b>1= not very</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5= very</b>	<b>Ave</b>	<b>St Dev</b>	<b>N=</b>
Graduate student as supervisor	13%		25%	13%	50%	3.88	1.47	8
Mentor as supervisor			30%	30%	40%	4.1	.88	10

Students who gave their supervisor (whether mentor or graduate student) high ratings said that their supervisor provided them with the opportunity to ask questions, was able to answer their questions, and provided feedback about their progress.

*I had plenty of feedback and could get help when I needed it.*

*[My mentor] was incredibly helpful both with my research and with providing information about graduate school, jobs, life in CS in general...*

*The person I worked closely with, checked with me almost every day how well I am doing, come by to see if I ever had any problems, and also explained to me in depth any appropriate information he thought will be useful for me. I cannot imagine more attentive and friendly co-worker.*

*My advisor did an excellent job of coming up with an incredible project and encouraging creativity in research.*

*My mentor was very helpful in answering all of my questions and encouraging me in my research.*

*She understood my level of knowledge in the area very well and explained clearly and respectfully what needed to be done. She gave me just the right amount of space to work on my own but was always available to help, advise, explain...*

*She was willing to explain material, and helped get me started to the point where I could produce results on my own.*

*[My mentor] did her best to answer our questions whenever we had them. She would stop by and talk to us every day or two to ensure that we weren't too frustrated.*

Students did mention some problems with their interactions with their supervisor. Some said that their supervisor was not around a lot to answer their questions

*She did a very good job of making sure I felt included in the university community. She was also very good at helping me make the most of my time here. She was busier than I would've liked, but even that was a good experience of what a real research advisor might be like.*

*She was excellent in her field, but she was just not around very often.*

Others had access to their supervisor, but felt that their interactions were not very helpful for their work on their project.

*When I tried to talk to my mentor about my concerns, she seemed to have no understanding of how lost I was. I always felt like I had to talk my mentor more like a "boss" than a "mentor". However, my mentor did allow me to do 2 presentations (to work on my oral communication skills). I am a co-author on the paper the group was working on. I am in no way saying that I didn't like my mentor or that she wasn't helpful. I am just wishing that things could have gone smoother at the beginning.*

*My mentor tended to let me be a lot more independent and there was really nobody to help me much. She helped me with talking a lot about grad school and how to look for grad schools, but didn't really help a lot with my project. I felt like I didn't really know if I was living up to her expectations until the very last day when she finally mentioned something about it.*

*My mentor actually was often not around when I needed help or completely helpful when I went to her for questions. However, I feel that this actually helped me a lot by pushing me to take responsibility for my own research and to do what I needed to do to keep my research moving.*

*[My supervisor] was available to talk every week, but often had to be refreshed as to what I was*

doing.

### Interaction with mentor

The student participants interacted with their mentors fairly frequently, with 61% having contact with their mentor at least weekly, as indicated by a 4 or 5 rating.

**Table 28: Interaction with mentor**

Q52	N=18
1=almost never	
2	11%
3	28%
4	33%
5=almost daily	28%

Most (61%) students' primary interactions with their mentor were in one-on-one research discussions. A few (17%) said that their primary interactions were via email and 11% were through group research discussions. A few (11%) said that their primary method of interacting was that they had personal discussions about non-research issues.

### Value of having a female mentor

We asked the students about the value of having a female mentor. Many (66%) felt that this was valuable. As in previous years, many students felt that the gender of their mentor was important, and a few did not care about the gender and wanted an advisor who would be supportive.

**Table 29: Value of having a female mentor**

Q54	N=18
1=not at all valuable	
2	6%
3	28%
4	33%
5=very valuable	33%

Two-thirds of the students who provided comments explained why having a female mentor was important to them. Many of these students indicated that it was nice to see a role model in such a male-dominated field.

*I reported to my female mentors but most of the time was spent working with male graduate students. At the same time, I think there is/was a psychological benefit to even knowing that my female mentors were there. in the positions they were.*

*I think it really helped in terms of my self-confidence and level of comfort with ther. Also, it gave me a sense of "Wow, there are some really excellent women in this field," which I didn't have so much before.*

*It's always nice to know you're not the only woman doing CS, even if it feels that way sometimes.*

*It is encouraging to see another female as a professor in computer science, and to have a female role model in computer science.*



*It was encouraging to watch a woman just as much a part of the CS world as anyone else.*

*She was a role model for a successful woman in computer science.*

A few students said that the gender of their mentor was not important, as long as this person was supportive.

*It's valuable to have a mentor, but I think I would have gotten just as good experience with a male mentor.*

*It didn't matter very much to me that my mentor was \_female\_, but more that she would be supportive of women in CS. I was not as comfortable with my mentor the second summer as I was with my mentor the first summer, but both were good mentors. Having a \_mentor\_ was valuable, but I don't believe the gender of my mentors really would have mattered.*

*I am not sure if this was because I had a female mentor or because of the particular individual I had as a mentor. Anyway, we developed good personal rapport, she guided me in all my confused situations and encouraged me in my improvement. That was something I really need and I am glad I have my mentor to talk to and get various information and support from her.*

#### *Mentor match*

Most students were satisfied with their mentor match. Their descriptions of this rating indicate that they answered this question by reflecting upon the match between their mentor's and their own work styles, interests, and personality. One student mentioned that she didn't spend enough time with her mentor to answer this question; she worked primarily with graduate students.

**Table 30: Satisfaction with mentor match**

<b>Q55</b>	<b>N=18</b>
1=not at all satisfied	
2	
3	28%
4	39%
5=very satisfied	33%

The following comments provide a picture of the matches between the mentors and students.

*She has a very good blend of theoretical and concrete, although she maybe bends more on the practical side. Also, I was curious about AI and progress therein, and she did a good job of introducing me to the subject and research.*

*I felt my interests and the interests of my mentor matched very well.*

*Worked out fine. I was interested in what she was doing, and we had similar hours we liked to work*

*My mentor was good at the general parts of mentoring me, but my project was only vaguely related to anything I wanted to do. It was frustrating to be placed with someone who didn't have similar interests at all. The school I was at didn't even have something that fit with my interests. It would have been nice if there was at least someone at the school who would have had an interest similar to*

*mine so I could talk with that person about grad school.*

*I could talk with her about grad school questions and my project. She would treat us to drinks at the coffee cart.*

*We got along well.*

*[My mentor] and I share quite a few views about the academic world, so we work very well together. The most valuable thing she did was treating us like we were her peers, letting us make decisions on our own. I had taken two classes from her prior to the DMP project, so I knew what to expect and was very happy with the match.*

*My mentor was very pleasant and patient with students. We had no personality clashes.*

*Things just worked out, and I found a very interesting and challenging person in my mentor. We understand each other very well.*

*We got along great! Worked well together.*

#### *Contact with mentor since the program*

Many (78%) of the student participants have been in contact with their mentor since the program and many (83%) plan to contact their mentor in the future. Six have or plan to ask their mentor for a letter of recommendation; two are working with their mentors on a research project; two have interacted or will interact about a research results from the DMP; one attended a conference with her mentor; seven have emailed or plan to keep in touch via email.

#### **Social Activities**

In previous years, some student participants have felt isolated and lonely during the program because they were in a new city for just a short amount of time. We asked students two questions about their social activities. We asked how frequently they spent time with others and how satisfied they were with their social life while in the DMP. It appears that many (61%) of the students had the opportunity to spend their free time with others and half were very satisfied with their social life in the DMP.

**Table 31: Frequency of social activities**

<b>Q61</b>	<b>N=18</b>
1=I spent most of my free time by myself	
2	17%
3	22%
4	33%
5=I spent much of my free time with others	28%

**Table 32: Satisfaction with social life**

<b>Q62</b>	<b>N=18</b>
1=not at all satisfied	
2	17%
3	17%
4	17%
5=very satisfied	50%

Those who gave lower ratings emphasized that they didn't spend much time with other students.

*I didn't really get a chance to socialize with any of the graduate students except for when I attended the conference. I did occasionally go out with one of my roommates, but since I'm an older student I found I didn't have much in common with my younger roommates. Mostly I spent my evenings alone in my apartment.*

*I spent a lot of time alone, since there were very few people around during the summer. But I did meet a lot of people with whom I spent some of my free time.*

Those who gave a high rating emphasized that they were in many activities outside of their work.

*At the end of the summer, I had had a going away party, played on the CS-Math Softball team that went to the finals (they played twice a week), played soccer with the CS folks, went to different parties and movies and such with folks in the lab. I also tried to hang out with as many people as students (American undergrads) in my dorm as possible.*

*For the first time after the busy university schedule, I had some free time in the evenings and on weekends. The other girl attending the DMP, who was my roommate as well, had her car there so we were able to go to concerts, travel in beautiful Utah. We also went out regularly with some of our colleagues, attended various parties or the famous professor dinners. I was able to go to the gym almost every few days, and I found it very useful for my fitness balance. I was meeting with various people all the time, I had fun and I felt happy.*

### **Suggestions for the program**

Most of the suggestions that the participants made were placed in those parts of the report where they were most relevant. One area that was not covered in the report was brought up by two participants: finding some way to connect the previous and current DMP participants.

*Also, it wouldn't hurt to give out names of previous participants to new participants so that those who would be willing to do so could answer questions for people who would like that.*

*I believe, it would be very useful if participants are able to gather together and share their experience. That could be another useful experience*

### **Conclusion**

As in previous years, the students report having a valuable experience in the DMP. Many enjoyed their experience with a research project and the chance to interact with a female researcher in CS&CE. Most participants left with improved research skills, a professional contact (in their mentor), more confidence in their abilities in CS&CE, and a better understanding of, preparation for, and commitment to graduate school in CS&CE.

In later reports, we will document the career paths that 1994-1999 participants have taken since they have left the program. In particular, we will look for the rate at which these students enroll in and earn advanced degrees. Although this can't be directly tied to the DMP, the interviews and surveys of these participants reveal that the DMP has been influential in their decision and motivation to pursue graduate studies.

## Appendix A: 1998 and 1999 DMP Participants' Survey

NOTE: The term "CS&CE" used throughout the questionnaire to stand for "Computer Science & Computer Engineering"

### *Contact Information*

1. Name:
2. Permanent address:
3. Permanent phone:
4. Local phone:
5. Email address:

### *Background Information*

6. Ethnic identity:
7. Undergraduate institution:
8. Class standing when applied for the CRA Distributed Mentor Program (Fr, So, Jr, Sr):
9. Projected graduation date:  
Month \_\_\_\_\_, Year \_\_\_\_\_
10. How many CS&CE courses had you taken prior to the DMP?
11. Major(s)  
1st:  
2nd:
12. GPA overall (convert to a 4 point scale, if necessary):

### *Interest in CS&CE*

13. a. Which of the following factors which are most important in your choice to study CS&CE. (Please indicate each with an "X" for each factor.)  
b. Rank the top 4 factors in terms of their importance in choosing to study CS&CE with a "1" indicating the most important factor and "X"s for the other 3.

Important Factors	Top 4
_____	_____ A teacher encouraged me.
_____	_____ I am good at math and science.
_____	_____ A relative is in CS&CE.
_____	_____ A friend is in CS&CE.
_____	_____ CS&CE is enjoyable and interesting.
_____	_____ CS&CE affords many career opportunities.
_____	_____ I like the idea of being a computer scientist.
_____	_____ CS&CE is challenging.

- \_\_\_\_\_ CS&CE jobs pay well.
- \_\_\_\_\_ My work experience led me to choose to study CS&CE.
- \_\_\_\_\_ My employer encouraged me.
- \_\_\_\_\_ Other (please specify)

14. When you were an in-coming first-year college student, were you considering CS&CE as a possible major?

- Yes
- No (Major: \_\_\_\_\_)

15. How much do you agree with the following statement?

"I feel that I 'fit' in the field of computer science."  
 (strongly disagree =1    2    3    4    5=strongly agree.): \_\_\_\_\_

16. Do you plan to stay in the field of CS&CE long-term?

- Yes
- No
- Undecided

*Graduate School*

17. Are you currently enrolled in graduate school in CS&CE?

- Yes (Where? \_\_\_\_\_)
- No

18. If you are not currently enrolled in CS&CE graduate school, are you planning to attend graduate school in this area?

- Yes, I plan to attend graduate school in CS&CE within a year of graduation from my undergrad
- Yes, I plan to work first, and then attend graduate school in CS&CE
- No, I do not plan to attend graduate school in CS&CE
- Undecided

19. If you are not planning to go to graduate school in CS&CE, what are your most likely post-graduation plans?

- Job, in the field of \_\_\_\_\_
- Graduate school in the field of \_\_\_\_\_
- Other: Please explain

20. What is the highest degree you plan to pursue?

- B.S./B.A.
- M.S./M.A.
- Ph.D.
- Professional Degree (Law, M.B.A., M.D.)
- Undecided

21. In deciding whether or not to go to graduate school in CS&CE, which of the following factors provide/provided ENCOURAGEMENT to go? (Indicate each factor with an "X.")

- Level of success in undergraduate CS&CE
- Influence of family member
- Experience/mentor during my high school years or earlier
- Work experience

- Career goals
- Technical interests
- Advisor/mentor at undergraduate institution
- Extra-curricular activity at undergraduate institution (e.g. research projects, programming team)
- Distributed Mentor Project experience
- Other factors (please explain):

22. In deciding whether or not to go to graduate school in CS&CE, which of the following factors make/made you feel DISCOURAGED about going? (Indicate each factor with an "X.")

- Level of success in undergraduate CS&CE
- Influence of family member
- Experience/mentor during my high school years or earlier
- Work experience
- Career goals
- Technical interests
- Advisor/mentor at undergraduate institution
- Extra-curricular activity at undergraduate institution (e.g. research projects, programming team)
- Distributed Mentor Project experience
- Other factors (please explain):

23. Before participating in the DMP, to what degree did you have an understanding of graduate school life?

(no understanding at all = 1    2    3    4    5= a thorough understanding): \_\_\_\_

24. Now, after having participated in the DMP, to what degree do you have an understanding of graduate school life?

(no understanding at all = 1    2    3    4    5= a thorough understanding): \_\_\_\_

25. Before participating in the DMP, to what degree did you feel prepared for graduate school in CS&CE?

(not prepared at all =1    2    3    4    5 = very prepared): \_\_\_\_

26. Now, after having participated in the DMP, to what degree do you feel prepared for graduate school in CS&CE?

(not prepared at all =1    2    3    4    5 = very prepared): \_\_\_\_

27. How would you describe your commitment to going to graduate school in CS&CE before participating in the mentor program?

(0=hadn't really thought about it, not considering it =1    2    3    4    5=very committed): \_\_\_\_

28. How would you describe your commitment to going to graduate school in CS&CE after participating in the mentor program?

(0=hadn't really thought about it, not considering it =1    2    3    4    5=very committed): \_\_\_\_

*Experience at Undergraduate Institution*

29. Outside of your courses, how regularly do you have informal, social conversations with the following

people in the CS&CE department?  
(not at all=1 2 3 4 5=very frequently)

- \_\_\_ Undergraduate male students
- \_\_\_ Undergraduate female students
- \_\_\_ Graduate male students
- \_\_\_ Graduate female students
- \_\_\_ Male faculty
- \_\_\_ Female faculty

30. Relative to your peers in your CS&CE classes, how would you rate the following prior to your participation in the DMP using the following scale: (low=1 2 3 4 5=very high)

- \_\_\_ Level of preparation in CS&CE
- \_\_\_ Ability to do CS&CE
- \_\_\_ Interest in CS&CE

31. Relative to your peers in your CS&CE classes, how would you rate the following after to your participation in the DMP using the following scale: (low=1 2 3 4 5=very high)

- \_\_\_ Level of preparation in CS&CE
- \_\_\_ Ability to do CS&CE
- \_\_\_ Interest in CS&CE

32.

a. Do you consider any of the female faculty in your department to be role models for you in CS&CE?

\_\_\_ Yes \_\_\_ No

b. Do you consider any of the male faculty in your department to be role models for you in CS&CE?

\_\_\_ Yes \_\_\_ No

33. Are there any faculty in the CS&CE department who have taken an interest in your progress in CS&CE?

\_\_\_ Yes \_\_\_ No

If yes, in what ways did this person or these people take an interest in your progress?

34. How involved in the CS&CE department do you consider yourself?

(not involved at all=1 2 3 4 5=very involved): \_\_\_\_

35. To what degree do you feel like you are a part of the CS&CE department?

(not at all=1 2 3 4 5= very much): \_\_\_\_

*Experience in the CRA-DMP*

36. How did you learn about the DMP?

37. What motivated you to apply for the DMP? (check all that apply, placing a 1 by the most important)

\_\_\_ It would be paid summer work.

- It would give me the opportunity to do research in computer science.
- It would give me the opportunity to work with a female academic researcher.
- It would give me the opportunity to go to a different institution.
- It would give me the opportunity to learn about graduate school to see if it was right for me.
- It would strengthen my application for graduate school.
- Other, please explain

38. Please rate your overall satisfaction with the DMP.  
(not at all satisfied=1 2 3 4 5 = very satisfied):  
\_\_\_\_, please explain

39. This question has three parts. Of the following possible program outcomes, which ones did you:  
a. WANT from the program?(Indicate each item with an "X" in the appropriate column.)  
b. Actually GAIN from the DMP? (Indicate each item with an "X" in the appropriate column.)  
c. VALUE MOST? (Indicate UP TO 4 items with an "X" in the appropriate column and include only outcomes that you actually gained from the DMP.)

a:WANTED	b:GAINED	c:MOST VALUED
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A letter of reference
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Professional contacts

Information on how to:

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Select a graduate school
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Find other research opportunities
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Succeed in graduate school
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Select a thesis/research topic
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Develop better research skills
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Conduct a job search
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Write and develop a resume
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Balance family and work
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Balance work and personal life
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Deal with departmental politics
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Deal with sexual harassment

Information on:

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Applying to graduate school
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Career opportunities and options
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Fellowship opportunities
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Successful interviewing
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Publishing; making presentations
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Building self-confidence
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Other: (please specify):

### Procedures

40. Within a few days of your arrival at your mentor's institution, were the following items: (check all that apply)

Explained to you?

- The goals and expectations for your research project
- How this project was related to your mentors' research
- Who to ask when you have questions



- When and how to contact your mentor when you have questions for her Prepared for you?
- Your work setting (office, computer, lab, etc)
- Identifications for using the services of the department such as a lab account
- Identifications for using the services of the university (library cards, other id cards)
- A research project

41. How was the housing search? (check only ONE)

- Fine, I was able to do it my self with little or no difficulty
- Fine, my mentor helped me to find housing and we had little or no difficulty
- Somewhat difficult, I did not receive any help from my mentor and had difficulty finding a place
- Somewhat difficult, my mentor and I had trouble finding housing
- Other, please explain

*Research Project*

42. Please rate the value of the research experience you had in the DMP.  
(not at all valuable=1 2 3 4 5= very valuable):

, Please explain your rating

43. Was this your first experience with research?

- Yes  No

44. Please indicate the degree to which you had the technical background necessary to do your research project when you began the DMP. (check only ONE)

- I had the preparation I needed do the project immediately
- I needed to do some background reading for a short period of time
- I never had sufficient background to do the project

45. How would you characterize your project? (Place an "X" by ONE choice)

- Like busywork (routinely applied a "canned" procedure, no real intellectual challenge)
- Similar to a large class project (programming, executing a clearly defined plan, etc.)
- Like real research, in that there was no known solution to the problem
- Other: please explain.

46. Was your project: (check all that apply)

- related to your mentor's research?
- challenging to you intellectually?
- valued by your mentor and/or members of her research team?
- structured in a way that it could be completed during the 10 weeks of the DMP?
- in your area of interest, if you had one?

47. Were you able to complete your project?

- Yes
- No, please explain.

48. Did you write up your project and/or do a presentation on it?

- Yes (please explain what you did.)

\_\_\_ No

*Involvement with research community*

49. How would you characterize the degree to which you worked with others in the DMP?  
(worked primarily alone=1 2 3 4 5=worked side-by-side with others)

50. Who was your direct supervisor?  
\_\_\_ One or more of my mentor's graduate students  
\_\_\_ My mentor(s)  
\_\_\_ Other, please explain

51. Please rate your overall satisfaction with how your supervisor carried out his/her role.  
(not at all satisfied=1 2 3 4 5=very satisfied)

\_\_\_, Please explain your rating

52. How frequently did you interact with the following people while you were in the DMP?  
(almost never=1 2 3 4 5=almost daily)

\_\_\_ mentor(s)  
\_\_\_ supervisor  
\_\_\_ members of the research team

53. To what degree did you feel like a valued part of the research team?  
(not at all=1 2 3 4 5=very valued):

\_\_\_, Please explain

*Interaction with mentor*

54. Please rate the value of having a female mentor.  
(not at all valuable=1 2 3 4 5=very valuable):

\_\_\_, Please explain

55. How do you feel about the match between you and your mentor?  
(not at all satisfied=1 2 3 4 5=very satisfied):

\_\_\_, Please explain

56. What was the primary type of contact between you and your mentor? (Place an "X" by ONE of

following.)

- Email
- One-on-one research discussions
- Group research discussions
- Social activities
- Personal discussions about non-research issues

57. Have you interacted with your mentor since finishing the DMP?

- Yes (please explain)
- No

58. Do you have any plans for interacting with your mentor?

- Yes (please explain)
- No

*Interactions with others*

59.a. Did you use the email discussion forum?

- Yes
- No

b. If you answered "yes" to question #45, in what ways did you use the forum? ("X" all that apply)

- Posted a message to the student forum
- Posted a message to the forum for mentors and students
- Responded to a message posted to the student forum
- Responded to a message posted to the forum for mentors and students
- Read messages posted by mentors or students

60. If you did not use the email forum, why not? ("X" all that apply)

- Lack of time
- Lack of confidence that the message would be confidential
- Not enough interaction on the forum
- Did not know about it
- I do not regularly participate in email forums
- Other (please specify):

61. How would you describe the frequency of your social activities over the summer outside of your work in the DMP?

(I spent most of my free time by myself =1      2      3      4      5=I spent much of my free time with others): \_\_\_\_

62. How satisfied were you with your social life outside of your work in the DMP?

(not at all satisfied=1    2    3    4    5=very satisfied)

\_\_\_\_, Please explain a low rating

63. Did you have any difficulties in the DMP that you would like to the organizers to know about?

64. Is there anything else you think is important for the organizers of the DMP to know as they make improvements to the program?

THANK YOU FOR YOUR PARTICIPATION!