MENTORING FOR 2000 AND BEYOND

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Summary

Today, more than 40% of the United States workforce are women. However, only a small percentage of working women are employed in science or engineering fields. The numbers of women in engineering and math professions have actually decreased since 1984. Last year, a mentoring program was created at NASA Ames Research Center aimed at encouraging young girls to stay in school, increasing their self confidence and helping them perform better academically. Teachers at the Ronald McNair Intermediate School matched fifth through eighth grade students with women engineers at NASA Ames. Results from a year-end survey submitted by the mentees indicated that the program was successful in achieving its first-year goals; more than one student reported that she felt "really special" because of her mentor's efforts. The NASA Ames Mentor program has continued into the 1992–93 academic year with both returning mentor/mentee pairs and new participants.

Introduction

In 1991, NASA Ames Research Center in Mountain View, California, began the NASA Ames Mentor Program as a cooperative effort between the Ames Advisory Committee for Women (ACW) in conjunction with the Educational Programs Office "Adopt-a-School" program, and Ronald McNair Intermediate School. The ACW at Ames recognized the need to retain women and to expose girls to careers in Science and Engineering. The Ames Mentor Program was set up to encourage young girls to pursue academic interests and increase their self-confidence, by providing them the opportunity to develop a personal relationship with a consistent, reliable adult committed to working with them for at least a year.

"Mentoring" provides a one-to-one relationship between an adult and a student. In the Ames Mentor Program, government civil service and support service contract employees provided guidance, opportunities for learning, and friendship to fifth, sixth, seventh, and eighth graders at Ronald McNair School in East Palo Alto, California. In 1991, the student ethnic profile at McNair was 50% Black, 47% Hispanic, Asian 2%, and White 1% (ref. 1). Many of the students in the area are considered to be "at risk" for dropping out of school or not electing to attend college for socioeconomic and cultural reasons. Through a variety of activities described in this paper, Ames Mentors helped expand students' horizons with exposure to experiences and opportunities to which they might otherwise not have had access.

Ames Mentor Program

The Ames Mentor Program was patterned after the Norwalk Mentor Program in Norwalk, Connecticut. The Norwalk model offers a six step process to establish a mentor program (ref. 2). Those six steps are:

1. Recruit mentors
2. Orient and train mentors
3. Match mentors with students (mentees)
4. Have mentor/student meetings
5. Evaluate progress
6. Celebrate at year's end and renew mentors' commitments

At Ames, those six steps were implemented by Aga Goodsell, Mentor Program Coordinator for the pilot program during the 1991–92 academic year. After receiving approval and support for the program by McNair, Goodsell obtained a mailing list of the female civil servants employed at the center, and distributed flyers soliciting mentor interest in the program. A small advertisement was then placed in the *Astrogram*, the NASA Ames news bulletin, to generate interest in the program. Mentors were also recruited by word of mouth. Fourteen women expressed interest in becoming a mentor and attended an informal information meeting at which the Program Coordinator presented the purpose of the program, ground rules, and expectations of the amount of time spent with each mentee. At this meeting the mentors filled out information sheets on their background and interests. The mentors also discussed the types of individual activities, field trips, and support from the school and

the Center that would be provided throughout the 1991–92 school year.

The teachers at McNair School chose the potential mentees they thought would benefit and showed interest in the program. Subsequently, the identified mentees completed an information sheet of interests so that the school could "match" the mentors and mentees. Each mentee was given a permission slip that was signed by a parent or guardian giving permission for the student to participate in the program. Once the matches were made, an introductory meeting was held at the school with the mentors, the mentees, and their parents. The Program Coordinator and Director of the "Adopt-a-School" program, Laura Shawnee, introduced each mentee and her parent(s) to her mentor, at which time they became acquainted and set up regular meeting times. The Ames Mentor Program required that the mentors meet with the mentees a minimum of two hours per month. Usually, the mentors would meet their mentee at the mentee's last period classroom or in the school library. Some mentors preferred meeting in a classroom after school, rather than the library where other students were studying. Others opted to take the mentees off campus and do a special activity elsewhere such as the city library, a bookstore, or even a college campus. In the classrooms some of the mentors would do arts and crafts activities with their mentee such as painting T-shirts or beading necklaces.

During the first year of the program, the Program Coordinator organized two field trips. The first was a visit to NASA Ames Research Center, and the second was to the Technology Museum in San Jose. The Ames field trip consisted of a guided tour through various facilities where the mentors worked. The tour began in the largest wind tunnel in the world, the 80 ft × 120 ft, where the mentors/mentees entered through the computer control room and then stood inside the massive test area of the wind tunnel. The next stop was the flight line where a mentor showed the mentees the various NASA experimental aircraft currently studied. The highlight of the day for many of the students was the Vertical Motion Simulator laboratory. Two NASA astronauts training on the Space Shuttle simulator flew the Shuttle with each mentee taking a turn as copilot. The mentees were then awarded Space Shuttle certificates, a momento of their trip. Many of the mentees wrote to the pilot they had flown with, thanking him for the simulator experience. To their surprise, each mentee received an autographed picture of the astronaut along with his autobiography! The final field trip to the San Jose Museum of Technological Innovation proved to be a popular event as well. The girls tried all of the hands-on design and interaction the museum offered such as walking through a life size computer chip assembly line, designing a bicycle and designing buildings to withstand earthquakes. The earthquake simulator allowed them to test their building designs with customized earthquakes.

Throughout the year the mentors held occasional meetings at Ames to discuss mentor/mentee relationships, suggested activities, and plans for group field trips. At the end of the year, mentees were asked to fill out an evaluation about their participation in the program. The consensus was that the field trips were fun and interactive and that they would have liked more of them.

Eight of the 14 students in the Ames Mentor Program completed the Mentor Program Evaluation forms. Responses were anonymous, and are summarized below. The percentage of "yes" answers is given in the right column.

How often did you and your mentor usually meet this past school year?

Once a week	50%
Once every 2 weeks	50%

How much time did you and your mentor usually spend together at your meetings?

1 hour	37.5%
2 hours	62.5%

What do you think of the time you spent together?

Just right	100%

What did you think of the field trips?

Liked them	100%

What do you think the mentor program was supposed to do for you?

"It was supposed to give me new experiences and meet new people."

"It was supposed to teach us new things."

"They were supposed to help us on our homework and projects too or in something else we needed help on."

"Teach us how to become more aware of the things that we have in life and to seek new opportunities in life."

"Help me to understand the basic standards in this world today."

"I thought the Mentor program was supposed to help you with your class work."

"It was supposed to show us friendship, teach us a little bit about NASA and sisterhood."

"To help me with my schoolwork, to help me with my problems, to have fun."

What do you think the mentor program did for you?

"It made me feel good, as if I were really someone special not just any normal student."

"I learned many new things, and had great experiences."

"What I think about the mentor program helped me a lot. It helped me in my homework, projects too and other things too. That's all I can think of."

"It taught my to think about the things that I could do and what to seek for in life."

"It help me and encouraged me to become a astronaut or scientist when I grow older."

"I think the Mentor program really helped me a lot with my classwork."

"I was shown a lot of things and did a lot of things."

"With the help of my mentor, I finished my school work and received good grades. I'm glad I had a female mentor; this way I could share my personal feelings with her and she understands. I really had fun with her."

McNair School hosted an appreciation event for the mentors and all other programs associated with the school. School personnel held a school-wide assembly with entertainment and food, and finished by handing out certificates to each of the mentors. In addition, the mentors received the mentee evaluation feedback, and were invited to participate in the 1992–93 program. Of the 14 mentors participating in the 1991–92 program, nine returned as mentors for the 1992–93 school year. Four of the 14 mentees from the pilot program returned. Many of the mentees were 8th graders who went on to high school, taking their experiences with them.

The Ames Mentor Program has continued into the 1992–93 academic year. Theresa Rose is currently the Program Coordinator at Ames, and the pilot program has been expanded in both execution and scope. Because so many boys at McNair School and men at NASA Ames expressed an interest, the Mentor Program now includes male mentors and mentees. The program participants felt it appropriate to include both sexes this year, as the boys are also likely to benefit from the attention and experience they will get from a mentor. The Ames Mentor Program policy is to match mentors and mentees of the same sex, so the girls are not being shortchanged with the addition of boys to the program. To date, 42 mentors have been matched with McNair students: 21 girls, and 23 boys.

Both male and female mentors were recruited through a series of articles published in the *Astrogram* (NASA Ames in-house newsletter) as well as by last year's network of mentors. Potential mentors were required to complete a 1 hour orientation and training session, sign a Mentor Agreement Contract, and provide references for a background check. The training session was conducted by the 1992–93 Mentor Program Coordinator and the authors—all "graduates" of the 1991–92 pilot program. It covered the following topics:

1. Program Goals
2. Orientation to Ronald McNair School
3. What Makes a Mentor Relationship Successful
4. Qualities of a Good Mentor
5. Mentor Agreement Contract and Pledge
6. Stages of the Mentor Relationship
7. How to Get Communication Started
8. First Meeting Activities
9. Suggested Mentor - Student Activities
10. Activities That Worked for Last Year's Mentors
11. Mentors' Resources

A different approach to matching the mentors with the mentees was implemented this year. In September, all McNair students were presented with the opportunity to apply to the Ames Mentor Program by submitting applications. Teachers were then requested to recommend which of those students they felt might benefit most from a Mentor relationship. At the mentor orientation/training session, mentors reviewed the student's applications and each mentor selected the mentee they felt would, be a good match, as opposed to the McNair teachers making the match. After parents' permission was secured in writing, a "Meet the Parents Night" was held at McNair School.

A new feature in this year's program is the mentors' lunch time support group, held once a month where mentors share ongoing successes and problems, and to conduct further training. Another addition is the position of McNair School–Ames Mentor Program Liaison. This liaison, a teacher at the school, coordinates school activities such as a "Meet the Parents Night" and distribution and collection of permission slips for field trips.

As part of this year's evaluation data, the Ames Mentor Program is keeping records of the number of hours spent by the volunteers in the program. These hours include program coordination and training time as well as student contact time.

Summary

The authors feel that mentoring middle school students is a challenging but rewarding experience. Early in the program we felt that the students were testing us by missing appointments and not expressing their true desires or interests. However, one of our greatest challenges was to manage the amount of time the student wanted to spend with us, which was greater than we had expected. Another challenge we encountered was the cross-cultural experience due to differences in our backgrounds. As with most students, the mentees were sometimes not interested in doing school work, so we found it especially challenging to encourage them in their studies. Both authors believe that we have influenced our mentees lives in a special way. Through the school year we observed the shyness of our mentees disappear with willingness to open up about personal matters. We also found it rewarding to see the students' interest in science and engineering develop over time. We found it particularly rewarding to have the opportunity to provide guidance to one of our mentees in choosing high school "college prep" classes she originally did not intend to take, and with another mentee to help in the completion of a Science Fair project that was awarded first place. We hope that the encouragement and positive feedback we provided to our mentees will be taken with them in their future successful careers.

References

1. School Report/Rorte Escolar, 1990-1991, Ronald McNair School, E. Palo Alto, Calif., 1991.
2. Weinberger, Susan: The Mentor Handbook. Educational Resources Network, Norwalk, 1990.

Figure 1. 1991–1992 Ames Mentor Program participants.

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Figure 2. 1992 field trip at NASA Ames Research Center.