2006-1936: LESSONS LEARNED: IMPLEMENTING A LARGE-SCALE PEER MENTORING PROGRAM

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Lessons Learned: Implementing a Large-Scale Peer Mentoring Program

Abstract

Beginning in 1992 with the creation of the Center for the Enhancement of Engineering Diversity (CEED), peer mentoring programs were established at Virginia Tech to assist in the high school to college transition of first-year students from underrepresented populations enrolled in the College of Engineering (CoE).* Upper level students in the CoE who have successfully completed the transition process continue to serve as mentors, providing academic and social support to these new students as they adjust to the demands of the first-year engineering curriculum and their new social environment. These original mentoring programs, Academic Hispanic OutReach Alliance (AHORA), Black Engineering Support Teams (BEST), and Women in Engineering Support Teams (WEST) are instrumental in retaining students to the CoE.

As reported in the January 2005 issue of the ASEE's *Prism*, Virginia Tech was awarded a five-year $2 million NSF STEM Talent Expansion Program (STEP) Grant to increase its number of graduates in engineering and computer science.[1] As part of the efforts to that end, the peer mentoring programs were expanded during the fall semester 2005 to include all interested first-year students admitted to the CoE. Building on the success of the initial CEED programs, the projected increase was to serve 400 students with the creation of two new peer-mentoring programs, General Undergraduate Engineering Support Teams (GUEST) and Network for Engineering Transfer Students (NETS). With the implementation of GUEST and NETS, the number of first-year students participating as mentees increased from 126 in 2004 to 384 in 2005. In addition, the number of upper level students serving as mentors jumped from 32 in 2004 to 79 in 2005.This paper will outline the design and implementation of a large-scale peer mentoring program focusing mostly on the freshman programs of AHORA, BEST, GUEST and WEST. Lessons learned throughout implementation will be discussed as well as the first semester Grade Point Averages (GPAs) of first-year students participating in the program.

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Introduction

In her book *Giving much/gaining more: Mentoring for success*, Dr. Emily M. Wadsworth (2002) defines mentoring "as significant personal and professional assistance given by a more experienced person to a less experienced person during a time of transition" (p. 2).[2] This definition in conjunction with Schlossberg's Transition Theory, Chickering's Theory of Identity Development and Virginia Tech's motto, *Ut Prosim* – That I May Serve, has guided the

* Within the CoE at Virginia Tech, the term under-represented refers to women, African American, Hispanic/Latino, and American Indian students.

development of the peer mentoring programs offered to first-year CoE students at Virginia Tech over the past 14 years, and their recent expansion in fall 2005.

Dr. Bevlee A. Watford created the Office of Minority Engineering Programs in 1992, known today as CEED on Virginia Tech's campus. The first program this office implemented was the peer mentoring program, BEST. BEST was established to provide academic and social support to African American first-year CoE students during their transition from high school to college at a predominantly white institution (PWI). Figures 1 and 2 give support to the classification of Virginia Tech as a PWI.[3, 4] Academically successful and socially responsible upper-class African American CoE students served as mentors to those first-year students participating in BEST.

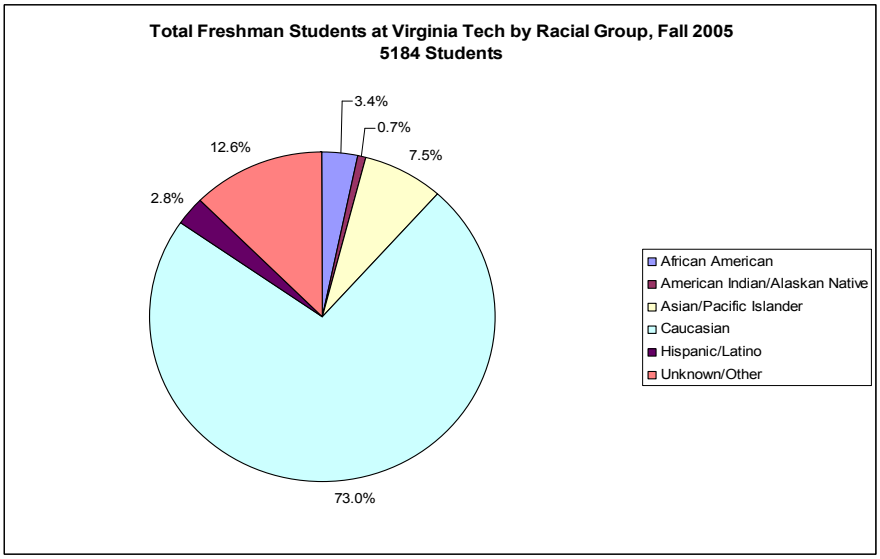

Figure 1. Self-indicated racial identity of the fall 2005 freshmen at Virginia Tech

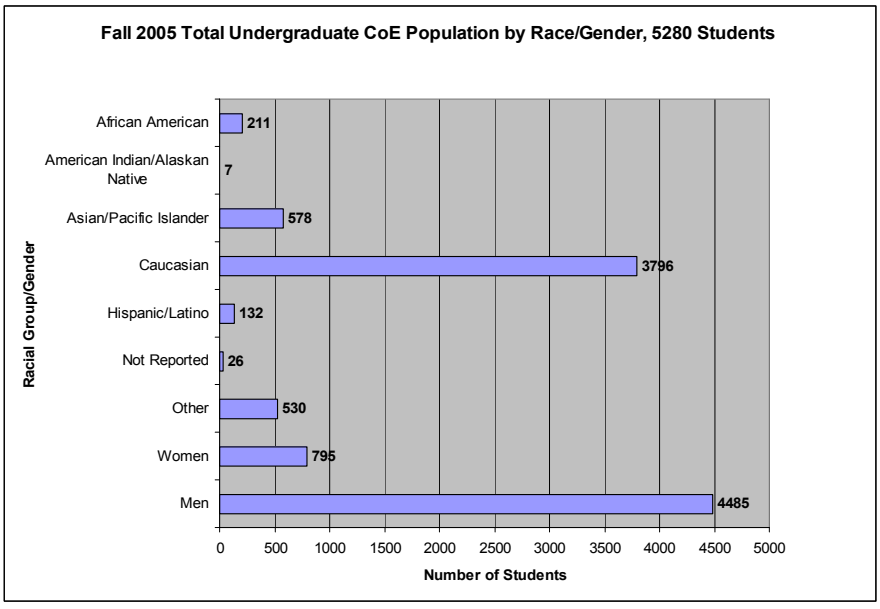

Figure 2. Total undergraduate CoE student population by self-indicated racial group/gender, fall 2005

The high school to college transition of the BEST students has been and continues to be of great importance to the CEED office; a negative transition can be detrimental to a student's first-year experience and have grave academic consequences. The creation of BEST, and subsequent CEED support teams, is grounded in Schlossberg's Transition Theory. Schlossberg defines a transition as "'any event, or non-event, that results in changed relationships, routines, assumptions, and roles' (p. 27)" (p. 111).[5, 6] A student's ability to cope with the high school to CoE transition is affected by his or her situation, self, support, and strategies, known as the 4 Ss.[6] Access to or lack of resources in any of these four areas can either be an asset or liability to the student. Since its inception, BEST has served as an asset in the area of support by providing African American first-year CoE students "affirmation, aid, and honest feedback" (p. 114) through their mentoring relationship, thus positively impacting the transition process and aiding in the success of their first-year experience.[6]

As Lasser and Snelsire reported, peer mentoring programs like BEST and others aim to "1) to provide an instant support network of minority students with similar goals; 2) to provide a social outlet; and 3) to give the mentor a forum for communicating the University policies, procedures and unwritten 'rules' the new students will need to help them adjust successfully to their new environment" (p. 767).[7] BEST is not now unique. Similar programs have been established across the US at higher education institutions with engineering departments and colleges. The establishment of these programs has been to increase the recruitment and retention of underrepresented populations pursuing and successfully completing engineering degrees by decreasing the sense of isolation and increasing the academic and social support in a predominantly white degree program.

Equally important is how these supportive mentoring relationships can enrich the first-year experience of these mentees and positively impact the student development of both the participating mentors and mentees. Chickering's Theory of Identity Development suggests that students develop their own personal identity by moving across seven vectors that include 1) developing competence, 2) managing emotions, 3) moving through autonomy and toward interdependence, 4) developing mature interpersonal relationships, 5) establishing identity, 6) developing purpose, and 7) developing integrity.[6] The mentors provide needed assistance as their mentees negotiate these vectors. As they support their mentees' development, the mentors will also be aided in their own journeys along these vectors. "Meaningful friendships and diverse student communities in which shared interests exist and significant interactions occur encourage development along all seven vectors." (p. 41)[6]

Building on BEST's success in addressing the needs of African American CoE first-year students, WEST was established in 1994 to address the needs of freshmen CoE women. Women, too can develop a feeling of isolation in the predominantly male CoE. Figure 3 displays the percentages of women and other underrepresented students in the CoE for fall 2005.[4] From fall 2005 data of the freshman CoE population, women account for 15.8% of the 1155 students.[4] As for their presence throughout the undergraduate population in the CoE during the fall 2005, 795 of the 5280 undergraduate students are women or approximately 15%.[4] Following suit in 1996, AHORA was established to assist Hispanic/Latino CoE freshmen students in their high school to college transition. As Figure 3 reflects, Hispanic/Latino students comprise only 1.7% of the CoE freshman student population.[4] Of the 5280 CoE undergraduate students, only 132 are

Hispanic/Latino.[4] Again, the CEED office would like these students to feel welcomed and supported, not isolated during this important transition. Similar to BEST, both WEST and AHORA employ upper-class women and Hispanic/Latino students to serve as mentors for these support teams. While the cultural and gender specific issues are unique to these two groups, the teams' purposes are the same as BEST, to increase the recruitment, retention and graduation rate of women and Hispanic/Latino students from the CoE at Virginia Tech and to support the students' development during the crucial first-year experience.

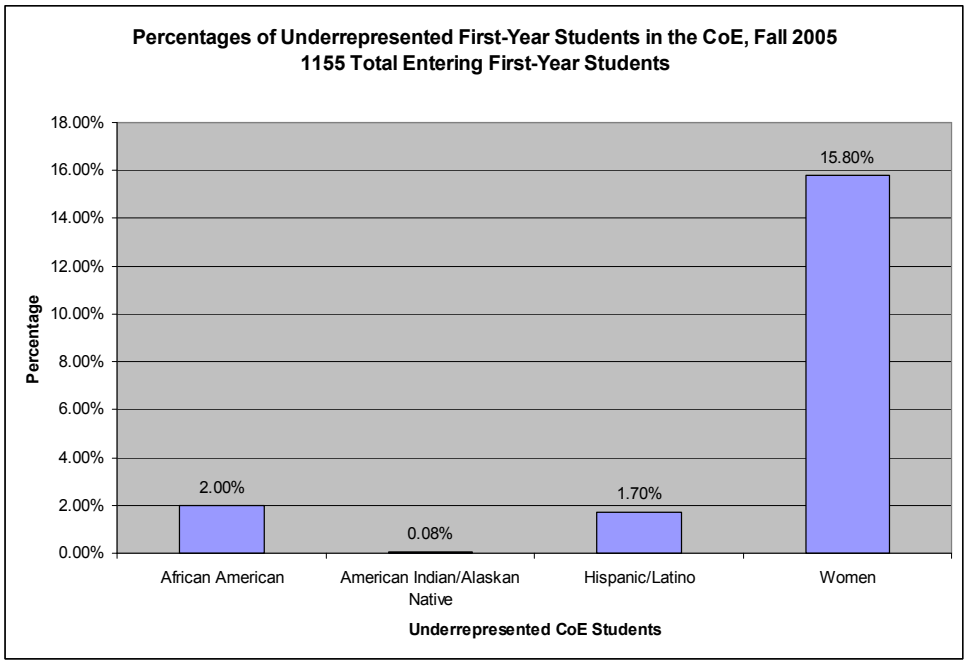

Figure 3. Total underrepresented freshman CoE students, fall 2005

Support for Expansion

Over the past 14 years AHORA, BEST and WEST have been successful at retaining underrepresented CoE students at Virginia Tech. As reported in the NSF STEP Grant proposal, "100% of the Team Leaders have earned their degrees in engineering. Additionally, surveys of freshman students indicate that 87% agree or strongly agree that participation in the mentoring program positively impacted their success during their freshman year."[8] The CEED office was awarded the NSF STEP Grant to fund the expansion of its undergraduate peer mentoring programs, among other initiatives, over a five-year period beginning in the fall of 2005. To aid in the increase of all students earning CoE degrees at Virginia Tech, not just underrepresented and women, the CEED office implemented two new mentoring programs, GUEST and NETS. While a sense of isolation may not be as much of a concern for the students who choose to participate in GUEST and NETS, these first-year students' transitional needs are of equal importance as they adjust to the academic demands of being a Virginia Tech CoE student. Following the design of AHORA, BEST and WEST, GUEST employs a group of upper-class CoE students from all backgrounds to serve as its mentors, while NETS recruits upper-class students who themselves had transferred from another higher education institution into the CoE at Virginia Tech. The next

sections of this paper will focus on the sequential steps taken to implement the large scale peer mentoring program at Virginia Tech in the CoE.

Hiring of Mentors

In 2004, AHORA, BEST, and WEST employed 32 mentors to serve the 126 mentees. To recruit mentors for all five programs to serve the anticipated 400 mentees for the fall semester 2005, a formal application and interview process was conducted during the spring semester 2005. Information on the mentor positions was posted on the CoE/CEED web site and sent out in email messages over student listservs. Requirements were instated to ensure candidates met certain standards. To be considered for the program, prospective mentors had to 1) be a Virginia Tech CoE student, 2) have completed their first-year of the general engineering curriculum and be accepted into one of the 11 CoE departments, 3) have earned an overall GPA of 2.5/4.0, 4) be a full-time student in the fall semester 2005, 5) be able to attend a four-hour mandatory training session the Friday before fall classes began, and 6) be registered for the one-credit hour Team Leader Seminar course.

From the pool of new and returning applicants, group interviews were conducted for two purposes; one, to manage the interviews of the 127 applicants and two, to observe the social skills and leadership styles of the potential mentors. Out of the 127 applicants, 79 mentors were provisionally hired contingent on the number of mentees who would voluntarily register to participate. The ratio of mentor to mentees was not to exceed 1:10 except in the case of NETS, which had only three transfer students apply to be mentors for the potential 154 first-year transfer students.[4]

Recruitment of Mentees

Initially, a paper brochure was sent to market the support teams to perspective CoE students who were admitted to Virginia Tech. From this brochure, freshman students were directed to the CEED web site and mentoring program web page. At this site, students could register for a specific team by completing the online registration form via a web-based survey program. Students could also return the paper brochure to register. Subsequent marketing efforts were utilized including presentations to incoming freshman students throughout the summer orientation programs. An initial deadline was imposed for applying to participate. However, at the end of July and the last day of summer orientation, the anticipated number of 400 applicants had not been met. The deadline was extended and a mass email was sent to all freshman students prior to the start of the fall semester to increase participation. Following this last recruitment effort, 350 or 30.3% of the 1155 freshman CoE students had registered to participate in the program. Figure 4 lists the number of mentors and mentees for each support team at the start of the fall semester. After the first two weeks of the program, mentors surveyed their members to determine who was staying in the program, who was dropping out of the program, who wanted to meet as an individual not as a team, who desired email only contact, or who wanted to switch teams. Of the original 381 participants, 61 chose to not participate, 4 switched teams, 13 preferred email-only contact, and 20 desired to meet individually with their mentors. The total number of first-year CoE students participating as mentees after the two-week trial period was

320. Of the 320 mentees, 310 were freshman accounting for 26.8% of the entering freshman CoE population.

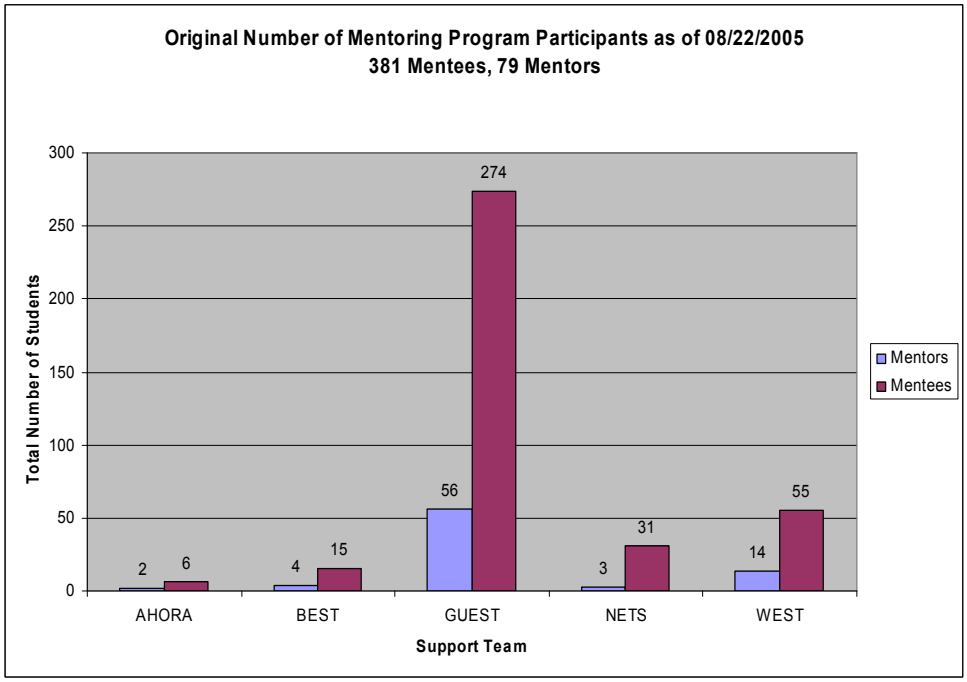

Figure 4. Fall 2005 peer mentoring program original participants

Developing the Peer Mentoring Relationship

Due to the program registration deadline extension, mentors were not assigned to their teams until the day of training. GUEST and WEST mentees were assigned to teams with students who lived in the same residence hall. Due to the small number of AHORA and BEST mentees, students were assigned to teams based on the proximity of their residence halls. Not all NETS students live on campus; therefore students were assigned to their respective teams by major. In the past, mentors were given their team members' names and contact information two-weeks prior to the start of classes to begin communication with their mentees. By having mentors contact their team members prior to the start of the semester, mentees felt welcomed and supported and developed an added sense of eagerness to start the fall semester. Mentors could field common questions from mentees such as what to expect at college and what supplies to bring from home to make the introduction to campus life at Virginia Tech more enjoyable.

As in the past, CEED held welcoming receptions the first two evenings of the fall semester for mentors and mentees to initially meet each other face-to-face. Instrumental faculty and administrators in the CoE also attended these receptions. From this point forward until the end of the fall semester, mentors were required to meet with their mentees once weekly as a team or individually, depending on the individual mentee's needs. Requirements for weekly meetings were left to the mentor and mentees choosing. Some mentors met their team at a local dining hall for ice cream in the evening. Other mentors stopped by their mentees' residence hall rooms to see how the week was going. Besides weekly face-to-face contact, mentors were expected to communicate regularly with their mentees via email, instant messaging, and/or phone.

Being available to answer questions or listen to concerns, both academic and social, deepened the mentoring relationship as the semester progressed. Three times during the fall semester mentors treated their teams to dinner. Mentors were given a meal card and their teams were allowed to spend $6 per person at each dinner engagement. Again, the dinner selection was left to the mentor and mentees choosing. Some mentors ordered pizza and brought it to the mentees' residence halls. Other mentors made dinner at their apartments and invited their freshman teams off campus. Some teams joined forces to allow their mentees the chance to meet other first-year CoE students at a campus dining facility or local restaurant. This social experience was intended to be relaxing and a much needed distraction from the academic demands of the semester.

Two large scale events and one closing activity were planned and implemented during the fall program. In conjunction with the Student Engineers Council, a course request help session for spring courses was facilitated by mentors and open to all mentees. Mentors representing specific engineering disciplines were available to answer questions about certain major-specific classes and professors and to assist students in completing the online course request process. An evening event was also held following the second Engineering Explorations test. Mentors and mentees met for a buffet-style social featuring chicken wings and vegetarian selections from a local restaurant. Music and a lively atmosphere provided a welcome release following the test. As a closing activity for the fall program, mentors assembled care packages to help motivate their mentees through final exams.

Seminar Format and Course Requirements

Two sections of the one-credit hour pass/fail team leader seminar course were offered during the fall semester. Fifty-nine mentors were enrolled in the Thursday afternoon section and 20 mentors were enrolled in the Friday morning section. Guest speakers provided insight on the culture of the Corps of Cadets, academic integrity, sexual assault, referring distressed students to the Counseling Center, and academic related resources through the Center for Academic Enrichment and Excellence,. In addition to guest speakers, discussions were conducted to develop a team atmosphere among the mentors and to share knowledge on different issues mentees were facing throughout the semester. Mentors were also informed of important deadlines and announcements at the CoE and University level to share with their mentees. The Blackboard™ 6 Course Management System was utilized in administering the class sections and serving as an information exchange through announcement postings and discussion forums.

Mentors were required to submit weekly reports summarizing the week's issues for his/her team. Once a month, mentors submitted individual reports on his/her mentees sharing more details on each student's needs and issues. A final report on each mentee was submitted at the close of the program. Mentors were paid for their involvement in the program at a rate of $7 per hour for 7 hours of work per week. Corporate contributions and STEP grant money provided funds for these wages, the three dinners per team and other events and activities associated with the program. The mentors earned a passing grade if they attended all class meetings and completed the requirements including written reports and team contact.

Assessment and Evaluation

To evaluate the effectiveness of all five of the CEED mentoring programs, validated pre- and post-assessment instruments were used. These were produced by the Assessing Women in Engineering (AWE) Project developed by the Pennsylvania State University and University of Missouri funded by The National Science Foundation (HRD 0120642). To view the survey instruments, visit the AWE web site at www.aweonline.org and register as a user. Once registered, the user may login to view all of the instruments available for use in assessing undergraduate engineering mentoring programs.

After the CEED office secured approval through the Virginia Tech Institutional Review Board, the AWE Undergraduate Engineering Mentee and Mentor Pre-Participation Surveys were sent to all participants who were 18-years of age and older by the date of the survey dissemination.[9, 10] Of the 320 participating mentees, 295 were eligible to complete the pre-participation and post-participation surveys. Due to a data error, five eligible students were not sent the survey link. To comply with the IRB regulations, only those students eligible to complete the surveys were sent the link to the electronic survey. Unfortunately, the pre-participation surveys were not implemented until after the program was underway making the baseline data inaccurate. At the conclusion of the program, the AWE Undergraduate Engineering Mentee and Mentor Post-Participation Surveys were distributed.[11, 12]

Of the mentee and mentor pre-participation surveys, 160 mentees and 73 mentors completed the initial assessments yielding return rates of 55% and 92%, respectively. Return rates for the mentee and mentor post-participation surveys were not as high; 114 or 39% of the mentees and 58 or 73% of the mentors responded. The decrease in the post-participation survey respondents could be attributed to the CEED office issuing only one email request to complete the survey, which was sent to all eligible participants at the end of the semester and in the midst of final exams.

Table 1 lists the pre- and post-participation survey responses of mentees related to their reasons for participating in the mentor program. Most students stated that they joined the mentoring program to meet other engineering students and to seek advice from upper level students serving as mentors. AWE defines an "'engineering community' as being the set of people and experiences that you interact with in your engineering classes, engineering advising and engineering related organizations. This would include engineering students, faculty, administrators, secretaries and staff."[9, 11]Related to the sense of isolation, when mentees were asked in the pre-survey if they felt part of their engineering community, 97 or 60.6% reported that they did feel connected with the community while 28 or 17.5% responded that they felt only marginally connected with their engineering community. Twenty-six of the students or 16.3% felt the reason they feel this way about the engineering community is that they have not been at the school long enough and 13 or 8.1% reported that they did not know how to become part of the community.

At the program's end, 28 or 24.6% felt they were very much part of the community, 48 or 42.1% felt that they were part of the engineering community and 27 or 23.7% felt they were only marginally part of the community. Seventeen or 14.9% felt that they had not been at the

university long enough to feel part of the community and 10 or 8.8% felt that they did not know how to become connected with the community.

In regards to a feeling of confidence and self-efficacy at the beginning of the program, 105 or 65.6% of the mentees were very confident that they would be enrolled in the CoE next year while 36 or 22.5% were fairly confident. Ninety-two or 57.5% were very confident that they would complete any engineering degree and 51 or 31.9% were fairly confident. On the post-survey, 73 or 64.0% were very confident that they would be enrolled in engineering next year, 27 or 23.7% were fairly confident, 4 or 3.5% were 50% sure, 1 or less than 1% was not confident and 1 or less than 1% was not confident at all. Sixty-five students or 57.0% were very confident that they would complete any engineering degree and 35 or 30.7% were fairly confident.

Table 1. Mentee goals for participating in the CEED large-scale peer mentoring program

My goals for participating in the mentor program are to:	**# (%) of Mentee Responses**	
	Pre-Survey: 160 Respondents	**Post-Survey: 114 Respondents**
Meet other engineering students	124 (77.5%)	90 (78.9%)
Make friends	112 (70.0%)	77 (67.5%)
Help me succeed w/particular engineering or engineering related coursework	115 (71.9%)	69 (60.5%)
Get/seek advice from upper division PROGRAM (BEST, WEST, etc.)	121 (75.6%)	80 (70.2%)
Help me to do well in engineering studies	111 (69.4%)	72 (63.2%)

As reported on the mentee post-participation survey, 68 students or 59.6% were strongly satisfied with their mentor assignment and 29 or 25.4% were satisfied. Twenty-four students or 21.1% were very satisfied with the opportunities for contact with other mentees in the program, 46 or 40.4% were satisfied, 26 or 22.8% were neutral and 9 or 7.9%were dissatisfied. Twenty-eight students or 24.6% strongly agreed that their participation made them more confident in their ability to succeed in engineering, 40 or 35.1% agreed, 32 or 28.1% were neutral and seven or 6.1% disagreed. Related to the quality of formal program activities, 26 or 22.8% were strongly satisfied, 50 or 43.9% were satisfied, 26 or 22.8% were neutral and 6 or 5.3% were dissatisfied. Thirty students or 26.3% were overall very satisfied with all aspects of the program, 58 or 50.9% were satisfied, 15 or 13.1% were neutral and 5 or 4.4% were dissatisfied. One-hundred and four students or 91% responded that they would recommend this program to a friend just starting engineering whereas four or 3.5% would not recommend the program.

Three opened-ended questions were asked of respondents on the AWE Undergraduate Engineering Mentee Post-Participation Survey. In response to the question "If a friend were just starting in your college, would you recommend to her/him that he/she participate in the mentor program?" one respondent stated, "It definitely provides a solid group of other engineering students that you can share your struggles and successes with over the course of the semester. The learning experience is amazing."[11] When answering the question "What kinds of things have you discussed or what activities had you done with your mentor?" one respondent replied, "We went to dinner a few times. We also had a movie night at her apartment. We also had a pregame breakfast at her apartment for one of the football games. We were supposed to go tubing on the

New River one of the first weekends we were here, but the water was too cold, so it got cancelled."[11] In response to the last question "What suggestions do you have for improving the mentoring program?" one mentee explained, "I would probably promote and advertise it a lot more. I know several students who had never heard about it and wished that they could have participated."[11]

Table 2 lists the pre- and post-participation survey responses from mentors related to their goals for participating in the program. On the pre-survey, 19 mentors or 26% reported feeling very much part of the engineering community, 43 or 58.9% part of the community and 11 or 15.1% marginally part of the engineering community. Fifty-four of the mentors or 74% reported on the pre-survey that they are very confident that they will be enrolled in engineering next year while 9 or 12.3% are fairly confident. On the post-survey, 15 or 25.9% reported feeling very much part of the community, 33 or 56.9% part of the community and 10 or 17.2% marginally part of the community. On the post-survey, 51 mentors or 87.9% reported that they are very confident that they will be enrolled in engineering next year, 3 or 5.2% are fairly confident, 3 or 5.2% are 50% sure and 1 or 1.7% is not confident.

Table 2. Mentor goals for participating in the CEED large-scale peer mentoring program

My goals for participating in the mentoring program:	**# (%) of Mentor Responses**	
	Pre-survey: 73 Respondents	**Post-survey: 58 Respondents**
Give my time/efforts to a worthy activity	61 (83.6)	46 (79.3)
Provide advice/mentoring to younger PROGRAM (WEST, BEST, etc.) students	61 (83.6)	47 (81.0)
Leadership skills	58 (79.5)	44 (75.9)
Build my resume	55 (75.3)	43 (74.1)
Have fun	49 (67.1)	39 (67.2)
Earn money	47 (64.4)	42 (72.4)

Table 3 lists the mentors' current abilities as reported on the post-survey. As mentioned previously, mentors enhance their own student development along the seven vectors through assisting first-year students. Most mentors reported that in addressing situations in their leadership activity they had at least some to excellent abilities. In addition, fifteen mentors or 25.9% reported on the post-participation survey that they strongly agree that their experience as a leader/mentor in this program met their goals for participation while 32 or 55.2% agree and 7 or 12.1% are neutral. Twenty-five mentors or 43.1% strongly agreed that help was available if needed to solve problems related to the mentoring role, 26 or 44.8% agreed and 2 or 3.4% were neutral. Twenty-four or 41.4% strongly agreed that they had adequate information to do a good job in their role, 27 or 46.6% agreed, 2 or 3.4% were neutral and 3 or 5.2% disagreed. Thirteen mentors or 22.4% strongly agreed that the activity was worthwhile, 33 or 56.9% agreed, 9 or 15.5% were neutral and 2 or 3.4% disagreed. Fifty-one mentors or 87.9% would recommend this activity to others.

Similar to the open-ended questions asked on the mentee post-participation survey, mentors were also asked to share their feedback on the AWE Undergraduate Engineering Mentor Post-Participation Survey. In response to the question, "Were there written or oral communications

available to you to describe your duties in this activity? If yes, please provide suggestions on how these could be improved." one mentor explained, "I think that the only thing i would suggest changing is making sure the mentors could contact their mentees over the summer break. I think that it would be nice for them to be able to meet with them during move in and lend a hand for that or something along those lines. Other than that, I think the emails and the postings on blackboard were sufficient."[12] Responding to the question "Would you recommend this activity to others? Please explain." one mentor stated, "I think it is a good activity for both the mentor and the mentees. Last year I was a mentee and I found it beneficial to have an upperclassman there to answer questions whenever I needed to. This year as a mentor, I find it helps me realize to take some of my own advice especially in terms of academics. In addition, it helped me to realize that I am very good at talking to people I don't know and making them feel comfortable talking to me."[12] In response to the last question "What do you like best about this activity?" one mentor stated, "the opportunity to build relationships with freshman. they are experiencing so much change in their lives so rapidly, it is great to be a part of helping them find their feet once again."[12]

Table 3. Mentor post-participation survey rank of leadership abilities

Current Abilities	**No Ability (0)**	**(1)**	**(2)**	**Some Ability (3)**	**(4)**	**(5)**	**Excellent Ability (6)**
To ensure that their mentees are satisfied with their participation	0	1	1	8	13	28	7
To solve a problem that arises during an activity without administrative staff	0	0	1	5	15	21	15
To deliver an effective presentation to participants	0	0	0	6	14	22	16
To take charge of leading a portion of a student activity	0	0	0	2	11	26	19
To solve interpersonal conflicts between participants effectively	0	0	2	6	17	24	11
To motivate participants to engage in an activity	0	0	3	6	17	26	9
To teach a hands-on skill	0	0	1	8	14	22	13
To adjust activities when things are going as planned	0	0	1	5	16	25	10
To make a positive change in the community through leadership activities	0	0	0	5	13	19	21
To talk with organizers about a problem with the activity	0	1	0	3	13	26	15
To set clear and attainable goals for mentees	0	0	1	3	17	23	14

Academic Performance and Retention

Due to the small numbers of African American, Hispanic/Latino and women students who did not participate in the first-year peer mentoring programs, accurate matches could not be made between mentees and non-participants to establish cohorts. To remain consistent with the survey results, only those students who were eligible to complete the survey had their academic performance calculated in the average GPA. Additionally, the five students who were inadvertently omitted from receiving the electronic survey link due to the data error were also left out of the average GPA calculation. Keeping that in mind, the average GPA of the 290 of-age first-year students participating in the mentoring program was 3.02/4.0 compared to the 2.83/4.0 average GPA of first-year students in the CoE at the end of the fall semester 2005. At the end of the spring semester and the 2005-2006 academic year retention rates of both mentees and the general first-year CoE population will be investigated and compared. Attrition from the CoE seems to be greater at the end of the full academic year rather than at the close of the fall semester. From the data collected at the end of the fall 2005 semester, women participating in GUEST had an average GPA of 3.18/4.00 compared with the women in WEST who earned an average GPA of 3.16/4.00. From this data it seems accurate to conclude that women CoE students were provided the support they needed to be successful in whichever group they most readily identified with and that best fit their needs. Going back to Schlossberg's Transition Theory, an asset or liability associated in the self area of the 4 Ss is gender.[6] Some women may not view their gender as a liability as they enter the CoE and thus join GUEST. Others, however may need the additional support and join WEST. The CEED office's main purpose is helping support the individual development of all CoE students based on the personal needs of the student.

Conclusions and Recommendations (i.e., Lessons Learned)

The expansion of the mentoring programs brought about many changes and lessons to be learned during the fall semester 2005. Overall, the first-run of the large-scale mentoring program was a success similar to the smaller programs of the past. The CEED office will continue to evaluate the responses that both the mentees and mentors shared and implement changes where appropriate.

Some initial changes that will occur for the fall 2006 program relate to marketing efforts, registration of mentees, hiring of mentors and the seminar format. Beginning this fall 2005, the CoE daily information sessions have included more information on the peer mentoring programs. The director of the mentoring program will meet with the CoE Academic Affairs Recruitment Coordinator to ensure that adequate and accurate information on all five support teams is shared with prospective students during the future daily information sessions. Upper-class undergraduate students honored with participation on the Dean's Team lead most of the daily information sessions. Several of these students also happen to be mentors. Their personal accounts of the program will also help encourage prospective students to join upon enrollment at Virginia Tech. Paper marketing materials and the web site will be enhanced with color photos of students interacting with their support teams and the student benefits of participating as illustrated in Table 1. The three free dinners, course request help session, and wing night events will be highlighted on the brochure and web site. A review of the information shared with

incoming first-year students during summer orientation will also ensure the dissemination of information on the programs, thus encouraging participation. A mass email will be sent to the each of the orientation session participants prior to their orientation visit to market the program to incoming first-year students. This information will again be reinforced at orientation.

To avoid the delay in mentors contacting their mentees and to promote initial contact prior to the start of classes, mentoring program registration for fall 2006 will end the last day of orientation at the end of July 2006. During the first week in August, teams of 7 to 10 mentees will be assigned to a mentor based on residence hall location of the mentees. More information will also be gathered on the registration form including intended major and interests outside of academics. When possible, within each residence hall, students with similar major intent and interests will be matched with an upper-class student within that major with similar interests. As reported on the mentee pre- and post-participation survey, one of the students' goals for participating in the mentoring program was to help them succeed with particular engineering or engineering related coursework.[9, 11] Having mentoring teammates as neighbors will lead to natural study groups and help the mentees be academically successful.

With the decrease in mentees following the second week of the semester, some mentors were left with only one mentee or no mentees on their team. These mentors were encouraged to join other teams to serve as additional support. Some of the unsatisfied responses related to the program could be attributed to these mentors feeling abandoned and useless. One of their goals for participating in the program was to give their time and efforts to a worthy cause.[10] Without a team to lead on their own, it is easy to see how they would be unsatisfied. During the hiring process in the spring of 2006, the CEED office will provisionally hire fewer mentors. With a goal of 400 mentees for fall 2006, no more than 50 mentors will be hired, thus keeping the ratio of mentor to mentees at no more than 1:10. With larger teams initially, mentors will have a greater chance of not losing all of their mentees after the second week in the program. Additionally by being a part of a larger team, mentees will meet more first-year students, another goal reported for joining the program.

To improve the relationship between the director and participating mentors and to enhance the team environment among the mentors on various teams, more sections of the Team Leader Seminar will be added. Individual sections for AHORA, BEST, GUEST, NETS and WEST will be added to allow these mentors more time to discuss cultural, gender, or developmental issues that specifically relate to each group. Having these team leaders know each other better will encourage their collaboration as teams for monthly dinners and other activities that will allow their mentees to meet more first-year CoE students and gain advice and perspectives from more upper-class CoE students. Upper-class students will also feel more confident in their abilities when they are able to learn effective techniques from their fellow mentors.

The utilization of the AWE surveys will continue. More time and thought will be devoted to acquiring baseline data. If mentees are contacted by their mentors prior to the start of classes, assessing the mentees' pre-sense of community will be difficult. Ultimately, the assessment and continual evaluation of the large-scale peer mentoring programs is paramount to its future success.

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