

Assessing the Effectiveness of a Peer Led Large Scale Peer Mentoring Program

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Abstract- Peer mentoring is continually being evaluated as an effective means of guiding new engineering students during various stages of their college endeavors. It is presumed that peer mentoring plays a role in retention of students in science, technology, engineering, and mathematics (STEM) fields. This paper compares the data collection from fall 2009 that was used to evaluate the initial implementation of a large scale peer mentoring program that is led by peers instead of a single administrator with data collected during the fall 2010 program. The major changes that were implemented in fall 2009 were shifting leadership from the single administrator to a group of six peer leaders, shortening the program length from a full semester to ten weeks, and utilizing the university's web-based course management system, Scholar. Based on feedback received during a focus group discussion and an online survey, significant changes for the fall 2010 program included developing a mentor handbook, providing peer leaders with more administrative responsibility, and assigning a group of mentors to one peer leader to improve the consistency of feedback and foster a peer leader to mentor relationship. Voluntary veteran and new mentors comprised a focus group that enabled feedback to be collected regarding the program leadership, effectiveness and organization of the program structure, and areas for future program improvement. Data was coded for qualitative themes to examine the effectiveness and success of the peer led large scale peer mentoring program in fall 2010 in comparison with the peer led model during its implementation year of fall 2009. Preliminary findings indicate that organization of the fall 2010 program was improved over fall 2009 and the structure allowed for peer leader-mentor as well as mentor-mentor relationships to be fostered. More consistent and timely feedback was provided over the 2010 program and there were positive comments about the new mentor handbook. Finally suggestions were made for future program improvement.

Keywords: peer mentoring, peer leaders

Introduction

Peer mentoring is continually being evaluated as an effective means of guiding new engineering students during various stages of their college endeavors. It has been shown that retention of these students depends largely on the availability of resources for the first-year students¹, and mentoring programs aim to expand on these resources. Mentoring of freshmen engineering students has taken many forms such as the University of Pittsburgh's required

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mentoring courses where a peer mentor leads a small group of 10-15 freshmen students² and programs directed at minorities such as Purdue's "buddy system" that pairs female upperclassmen with incoming freshmen³. One example of a large scale, peer mentoring program for first year engineering students is the Center for the Enhancement of Engineering Diversity (CEED) Mentoring Program at Virginia Tech. This program pairs groups of 3-7 new engineering students with an upperclassmen mentor who serves as a resource for academic issues, assists in developing skills, aids the transition to college life and acting as a sounding board for new thoughts and ideas. In order to provide the best program possible for the first year students, the CEED Mentoring Program is continually evolving. By evaluating the relative success of the program each year through focus groups and online surveys, feedback from mentors and mentees is incorporated into changes for the next year's program.

For the Fall of 2009, several major changes were implemented, including shifting leadership from the single administrator to a group of six peer leaders, shortening the program length from a full semester to ten weeks, and utilizing the university's web-based course management system, Scholar. Studies completed after the completion of the fall 2009 program have discussed these changes in great detail, and assessed the effect of these changes on the overall success of the program^{4,5}. Additionally, feedback was used to generate and incorporated several key changes for the fall 2010 program.

This study begins with a general overview of the CEED Mentoring Program, recent program changes, and the effectiveness of these changes evaluated through a focus group. Voluntary veteran and new mentors comprised the focus group that enabled feedback to be collected regarding the program leadership, effectiveness and organization of the program structure, and areas for future program improvement. The data was used to begin a longitudinal analysis with the data collected after the completion of the fall 2009 program. This paper examines the effectiveness and success of the Mentoring Program in fall 2010 in comparison with the peer led model during its implementation year of fall 2009. Emphasis is placed on assessing the effectiveness of the improvements made as a result of the fall 2009 data. In addition, recommendations are provided on continual program improvement. The following questions are addressed:

1. Have the changes incorporated as a result of the fall 2009 data improved the program?
2. What areas need to be improved for fall 2011?
3. How should these areas be improved?

Program Structure

The expansion of the Center for Enhancement of Engineering Diversity (CEED) began in 2004 with funding from the National Science Foundation STEM Talent Expansion Program (STEP) grant. Prior to 2004, the CEED program managed three mentoring programs: Academic Hispanic OutReach Alliance (AHORA), Black Engineering Support Teams (BEST), and Women in Engineering Support Teams (WEST). With the aid provided by the STEP grant, the CEED program expanded to include two additional teams: General Undergraduate Engineering Support Teams (GUEST) and the Network for Engineering Transfer Students (NETS). This expansion allowed the program to provide mentoring opportunities for all first year engineering students. The CEED mentoring program provides this assistance by assigning a peer mentor to first-year College of Engineering students who have elected to participate in one of the mentoring programs. The peer mentors are chosen through an in-depth interview process that ensures the mentor is prepared and willing to assist with and provide guidance in academic, professional, and social issues. In the 2010 year the CEED support programs had 319 active mentees and 46 active mentors. Note that these numbers represent a decrease in program size due to the separation of the themed housing programs; however, the themed housing programs offered by the CEED office provide many of the same resources to first year students. Additionally, the NETS program was no longer included as the needs of transfer students are significantly different from those of first-year engineering students.

The CEED mentors provide a steady, bonding relationship with their mentees by holding at least one meeting a week. These meetings are up to the mentor and mentees to organize; primary examples of meetings include: dinners, recreational activities, educational meetings, and/or training workshops. These meetings are designed to foster an open relationship between the mentor and mentees as well as to monitor the mentees' well-being both academically and socially. The mentors are encouraged to schedule at least three off-campus meals as part of their regular meetings. To support these off-campus meals, the mentors are given \$18 per mentee at the beginning of the program with the notion that these three meals will be spread over the 10 week duration of the program. In addition to the relationship between mentors and mentees, the CEED office hosts two social gatherings designed to bring the five mentoring programs together. The social gatherings provide an excellent opportunity for mentees and mentors to diversify and meet other individuals in the program.

The mentoring program requires that mentors attend a weekly seminar run by a single peer leader. Mentors are assigned to a peer leader at the beginning of the program and they attend this peer leader's seminar session throughout the duration of the program. This is separate from the previous year in which all mentors attended a seminar session led by all of the peer leaders. The topics covered in the seminar session adhere to a syllabus that is created at the beginning of the program. This ensures that the mentors are receiving appropriate information about upcoming events or training workshops while still enabling the mentors to discuss any problems or successes they may encounter. Lastly, the mentors are required to submit weekly reports and larger monthly reports. The weekly reports are designed to provide a summary of how the mentors' team is going while the monthly reports are designed to provide a closer look each mentee's progress. The assigned peer leader reads these reports and provides feedback on a consistent basis.

Changes for the 2010 Program

Based on the suggestions and recommendations generated after the completion of the fall 2009 program^{4,5}, several changes were made for the fall 2010. This section will outline the suggested changes, and how these changes were implemented for the fall 2010 program. The conclusion topics from the fall 2009 studies are presented in bold, and the associated changes for the 2010 program are presented with them.

Small Group Consistency - To promote networking amongst the mentors and to allow for more productive small group conversation, pre-defined small groups met with the same peer leader each week throughout the program. In 2009, the seminar was a single meeting with all peer leaders and mentors in attendance. The large size of this group led to disorganization and inefficiencies, and overall, mentors commented that meeting with the same mentor each week would provide a better forum for tracking issues from week to week as well as fostering a more productive peer leader-mentor relationship.

Feedback Consistency – In 2009, peer leaders read and responded to a different subset of mentors' weekly reports in an effort to provide different perspectives for difficult issues on a week to week basis. While the logic behind this "rotation" style feedback was sound, comments from the mentors led to the conclusion that the feedback lacked consistency because the peer leaders would often not understand the source and the evolution of a particular issue (because they were reading different reports each week). For the fall 2010 program, in order to promote consistency in feedback, the peer leaders read and responded to the weekly reports of the mentors in their seminar (small group) section every week. This was aimed at allowing the peer leaders to more easily track re-occurring issues and also promote the peer leader-mentor relationship.

New Mentor Training/ Buddy System – At the conclusion of the 2009 program, first year mentors commented that they had felt unprepared at the beginning of the program because the training process for new mentors did not adequately prepare them for the beginning of the program. After the first week or so, these mentors commented

that they had learned the process, but they would have liked more guidance from the start. In response to these comments, for the 2010 program, we originally specified that a buddy system pairing veteran mentors with new mentors would be used. This change was not concretely enforced as originally planned in all seminar sections, but rather it was encouraged (generally, seminar sections were planned with an equal number of veteran and new mentors). There were several instances of mentors planning joint meetings and outings with other mentors. These mentors were sometimes friends from outside of the program, had teams that lived in the same building, or simply were the same major and gravitated towards each other during seminar. In essence, though, the nature of the smaller seminar sections automatically had undertones of mentor-mentor support. During discussions, it was very common for a new mentor to pose a question and then a veteran mentor was able to effectively answer the questions based upon his or her prior experience. While we had planned to instate a formal system for this, it appears that the simple change to a smaller seminar section allowed the buddy concept to blossom naturally.

In addition, a New Mentor Handbook (a guidebook for new mentors) was created and distributed to all mentors during mentor training at the beginning of the semester. This handbook gave a general job description as well as the history and goals of the program. The guidebook also outlined our expectations of all of the mentors as well as provided instructions and examples of all of the paperwork (weekly reports, monthly reports and meal forms) associated with the job. Through this handbook, mentors were able to clearly see the proper format for all the administrative paperwork of the job as well as have a written guidebook for many of the “frequently asked questions” during the start of the program.

Agenda – At the conclusion of the 2009 program, mentors commented that they would like a more organized seminar structure, with discussion topics that could be carried on to their meetings with their mentees. To help organize a more structured seminar, a syllabus, which contained a clear agenda as well as talking points for use during both small group and large group discussion, was created for and used during the 2010 program. Topics on the syllabus were created to mirror significant events in the freshman engineering curriculum.

Scholar – Scholar, Virginia Tech’s online course management software was used for the first time during the fall 2009 program. Overall, mentors liked the centralized location for paperwork and resources, but commented that the site was difficult to navigate and disorganized. For the 2010 program, efforts were made to re-organize the Scholar site incorporating the feedback from the mentors. Additionally, each seminar section used a separate Scholar page to facilitate the submission and return of all reports and forms.

Methods

Settings and Participants

This assessment was conducted with the CEED support programs that assist freshman level College of Engineering students. In 2010 the CEED support programs were downsized from the previous year to include 46 mentors catering to 319 freshman engineering students. This downsize was due to the exclusion of students participating in the themed housing programs (as these programs provide many of the same resources for the students) as well as transfer students. Similar to the 2009 assessment, a focus group was offered to all active 2010 mentors. This focus group was comprised of 5 mentors, 3 males, 2 females, and 4 veteran mentors and 1 new mentor. The diversity of this focus group guaranteed unbiased results.

Data Collection

The data that was used for this assessment was collected from a focus group created at the end of the mentoring program. In order to use the information collected from the individuals who participated permission was received through the human subjects (IRB) review. This focus group was a voluntary group with participation offered to all

mentors present at the end of the mentoring program. Audio recording was performed at the verbal expressed consent of the five focus group members present. This audio recording was used during the data analysis stage to ensure accurate results from the focus group. The focus group was led by a graduate assistant in the CEED program who had no previous involvement with any of the focus group members. A semi-structured set of questions was developed prior to the focus group to structure the focus group assessment. These questions were similar to the questions presented during the 2009 focus group assessment, and are available from the first author.

Data Analysis

Open coding was used to systematically analyze the data and arrive at conclusions. The recorded audio from the transcript group was transcribed to begin the analysis process. The transcribed text was grouped into major discussion themes. These three themes were: Assessment of the single peer leader structure, utilization of Scholar in ensuring timely feedback, and improvements in training new mentors. These three main groups were separated into smaller groups for further analysis. Table 1 shown below presents the three main classes and the corresponding subclasses.

Table 1. Data Classification for Mentoring Program Data

Single Peer Leader Model Assessment	• Consistent feedback • Peer leader/mentor relationship • Structure of seminar
Utilization of Scholar	• Report submission techniques • Requirements of specific reports (weekly, monthly)
Training new mentors	• Creation of mentoring handbook • Pairing of veteran and old mentors

The data shown above will be discussed in the following sections.

Findings

An hour-long focus group with guided open-ended questions provided valuable qualitative information that was organized into three main categories listed above. Comparisons were made to the fall 2009 program when the shift of the large-scale peer mentoring program went from the single facilitator model to the peer led model.

Single Peer Leader Model Assessment

Consistent Feedback

Feedback is one of the most valuable components of the CEED mentoring program. In order to be successful, mentors need to receive quality, timely, and consistent feedback. Peer leaders would provide feedback to the weekly, monthly, and final reports submitted by each mentor. This year peer leaders were assigned to a set group of mentors to meet with each week in a group seminar, as well as to read their reports. Reports were submitted and feedback was given via Scholar, the University's web management system.

Initial rationale for assigning each peer leader a group of mentors was to promote consistency in feedback. The general consensus from this focus group was that the feedback was more consistent as stated by one participant, "I feel like there is a lot more consistency...and I felt like my feedback was noticed and you could see the changes throughout the semester." Regarding feedback, mentors discussed how the more relevant and pertinent information related to their mentoring experience was discussed in seminar. A mentor commented that, "I think some of the more valuable feedback I received was in the seminar when we would talk issues out loud, discuss it as a group and

the peer leader would chime in [and] that was some of the better feedback [be]cause it was instant feedback and it wasn't a week delay." This discussion in seminar also allowed for mentors to gain multiple perspectives on how to deal with certain situations, which was something they did not receive from having only one peer leader read their reports: "a downfall from last year is you don't get different perspectives. I know that my peer leader is very different from me when it comes to attitude and what not and the solutions were not what I would do."

Peer Leader/Mentor Relationship

Networking is another vital component to the success of a mentoring program as each individual skill sets and attributes bring diverse ideas and experiences to share with each other. In order to allow transfer of these experiences among mentors, it is important to create an environment which encourages open discussion and communication with each other. While each seminar has a scheduled topic for discussion that will ultimately help with the freshmen experience, it is flexible so that mentors can choose to divert to topics that will be more helpful fulfilling their mentoring needs.

Small groups were utilized this year to help foster networking and create a friendlier environment for discussion. One mentor commented that, "I liked the structure of having just one peer leader...you get to know a smaller group of [mentors] more personally." Another mentor agreed stating that, "Last year's structure was very hard, not very personable. You would just break into groups with a different peer leader every time. This year we got to know the other people in the class and also the peer leader."

As mentioned in the feedback section, mentors did feel that a second opinion could be valuable on certain issues "but if you did need to contact another peer leader I don't think that there is anyone who feels like they can't do that or it wouldn't be welcomed to contact somebody else." Generally speaking mentors felt comfortable going to their assigned peer leader or another peer leader for advice. One mentor commented that, "I feel like my peer leader would be good to talk to about graduate school or interviewing" while another mentor mentioned going to three of the five peer leaders for everything from mentoring problems, to interviewing skills, and even for advice on girlfriend problems.

Structure of Seminar

Like any new program, there are usually unanticipated oversights that sometimes create organizational glitches. Last year, it was determined that the peer leader model was hectic and chaotic due to lack of organization among peer leaders during seminar and lack of consistency between feedback. Since there were six peer leaders leading one seminar, it created confusion and it was difficult for mentors to know what was going on. This was another reason for switching to small mentor groups for each peer leader.

Seminar groups consisted of approximately 10-14 mentors and one peer leader. Each session was once a week and approximately one hour long. A downside to the smaller groups was that there were awkward moments of silence. One mentor commented that, "[In] the smaller group size sometimes no one would have anything to say. I don't know if it was the structure but sometimes there were just awkward moments where it was like 'anyone have anything to say?'" To combat this, peer leaders could have a handful of "back pocket" items to utilize in seminar if discussion and engagement is initially lacking.

Since there was only one peer leader leading a particular seminar, there was more organization. One mentor commented that, "I really enjoyed having my particular peer leader...the way they organized everything I always knew what to expect. It was nice to come in and have a very focused discussion for about 30 minutes or so and then go disseminate that information to my mentees."

Utilization of Scholar

Report Submission/Feedback Techniques

The week delay mentioned in the consistent feedback section above did not pertain to all mentors. Each peer leader had their own schedule when it came to reading and providing feedback to submitted reports ranging from one hour after reports were due to one week after reports were due. Either a weekly, monthly, or final report was due at the start of each seminar and was submitted to the Scholar site. A mentor mentioned that, “one downfall of Scholar was when your peer leader does respond there’s no way of notifying you. If it was email you would see it the next time you checked messages.” Providing more of a timeline for each peer leader to follow could negate some of the ambiguity as to when feedback would be received and give mentors a date to check back to the Scholar site for feedback.

Generally speaking, mentors felt as though they would do away with the monthly report. Mentors commented that they had difficulties writing the monthly report and that it was very repetitive: I don’t know [for] those monthly reports I was just really digging to find something to write about”. Initially, the monthly report was designed to help summarize weekly reports for the single facilitator to read in previous years. However, the Scholar site allows there to be a continual thread of submitted reports and provided feedback such that the mentor and peer leader can scroll through to easily reference past reports. One mentor mentioned having a one on one meeting with the peer leader in lieu of a monthly report to have it be more interactive and receive immediate feedback. Another mentor mentioned, “I want to keep the face time up between the mentor and the peer leader. I feel like we have a lot to learn from them.”

Training New Mentors

Creation of a Mentoring Handbook

With regards to training, this was the first year that a mentor handbook was provided. The handbook contained information pertaining to first phone calls to mentees, the welcome picnic, activities to do with your mentees, and sample weekly and monthly reports. Mentors gave positive feedback on the handbook: “I felt like whoever put the handbook together did a really great job...I saw everything in there about questions I had when I first started.” A new mentor commented that, “This was my first time being a mentor and I felt like I knew what was going on the entire time.” The handbook and overall better organization made it easier for mentors to be successful.

Pairing of New and Veteran Mentors

Another positive to the adjusted peer leader model structure was dividing seminar groups so that there was approximately a 50/50 split of new/veteran mentors. Though the “buddy system” discussed in a previous ASEE SE conference paper on the Virginia Tech mentoring program² was not implemented due to logistical constraints, mixing seminars so that there were both new and returning mentors allowed for some more networking and leadership experience. A mentor commented that, “I think some of the best resources for new mentors were the veteran mentors” and that if we incorporated a mixture of new and veteran mentors into training that could aid new mentors initially to learn things like places to take their mentees and the structures of their meetings.

Training was also better utilized this year to provide more tools for mentors to use. Even though training was somewhat repetitive for returning mentors it helped get them focused on what to do for the current semester. A returning mentor commented that, “compared to last year, if I was a new mentor I definitely would know what I was doing coming in.” A suggestion to improve training was to incorporate a time to mix new and returning mentors for returning mentors to discuss their experiences and give new mentors an idea of what to expect. Also, having a time two to three weeks into the program for new and veteran mentors to pair up could be beneficial since new mentors might not know initially what questions to ask before the program starts.

Additionally, another element of this year’s program was summer phone calls to mentors. Each peer leader called approximately 10-12 mentors to check in and see how initial contacts to their mentees went and if they had any questions about what to do within the first week of the program. A mentor state that, “I got a call from one of the peer leaders just checking in to see how the phone calls were going and any issues and I thought that was really a

nice thing to do. Actually, at that point I hadn't started making phone calls but that [kind of] got me together and made me realize I [have to] get going with it. That was helpful." It was beneficial that the peer leaders "checked in" to make sure mentors were doing what was necessary to make a good first impression on their mentees.

Conclusions and Recommendations

The changes implemented prior to this fall's mentoring program were a vast improvement upon the initial peer leader model. General consensus was that feedback was more relevant and consistent and that relationships among peer leaders and mentors were better fostered. However, there is still room for improvement. Below are some suggestions to implement for the fall 2011 mentoring program.

Program changes/updates:

- **Scheduled date to receive feedback:** Providing a date and time that mentors will receive feedback from their peer leaders will eliminate the ambiguity with when to check Scholar for feedback.
- **Replace monthly report with individual meeting:** In lieu of a monthly report, mentors should have a schedule one-on-one meeting with their peer leader. This will help to continually build the mentor-peer leader relationship as well as make a monthly "report" more interactive and less repetitive for both the mentor to write and the peer leader to read.
- **2-part training:** Training should be organized such that the first hour is general information disseminated to all and a refresher for veteran mentors. The second part will be more personalized for the new mentors as well as scenario-based to really give the new mentors a feel for what to expect.
- **Streamline how reports are submitted/ reviewed:** Each peer leader should set up Scholar so that reports are submitted and reviewed on one continual thread so that it is easier for both mentor and peer leader to reference past reports.
- **Reiteration of peer leader availability:** While most mentors felt they could go to other peer leaders for information, this could be reinforced and mentioned throughout the program. This will help mentors feel more comfortable going to other peer leaders for a second opinion.

Overall, this program at Virginia Tech is continually evolving and improving. This focus group provided valuable feedback needed to assess the effectiveness of program changes as well as future improvements that are needed. The five peer leaders developed the questions asked during the focus group, reviewed the transcript of the focus group to supply these recommendations, and drafted this paper, all in an effort to learn the value of assessment and subsequently enhance the upcoming 2011 program.

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