Implementing a Peer Leadership Model in a Large-Scale Peer Mentoring Program

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Abstract- Retaining students in engineering and the sciences depends largely on the availability of resources for first-year students, and as a result, mentoring programs have evolved to guide and support new engineering students [Gattis et al., 1]. As traditional notions of mentoring have changed, it has been seen within higher education that undergraduates are more frequently used as peer mentors [Budge, 2]. In the past, a peer mentoring program at a large research university on the east coast was led by one administrative faculty member. A major structural change to the program was made this year, to incorporate six peer leaders, all veteran mentors, who assumed many of the tasks of the original coordinator. Along with expanding leadership, other changes included shortening the program length from a full semester to ten weeks and utilizing Scholar, the university's web-based course management system, to streamline the administration of the program. A focus group comprised of both returning mentors and first-year mentors was created to assess the success of the change in leadership and overall program structure as well as provide recommendations for future improvement. The feedback gathered from this focus group led to the formation of six recommended changes for implementation. They included the formation of a more detailed agenda for weekly seminars, a buddy system for new mentors, improved organization and consistency in written feedback and small group discussions, and a reworking of the online course management site used in program facilitation.

Keywords: peer mentoring, peer leaders

Introduction

During the last decade, undergraduate enrollment in engineering has shown strong fluctuations. Freshman enrollment increased until 2003, experienced decreasing trends for 2003-2005, and then has gradually increased from 2006 to 2008 [Gibbons, 3]. Although the increase over the past few years in freshman enrollment numbers is promising, the retention of those students in engineering after their freshman year continues to suffer. Based on data from Gibbons' "By the Numbers," enrollment in engineering drops approximately 20% between freshman and sophomore year. This decrease in enrollment is primarily due to the challenging nature of the engineering curriculum coupled with the many adjustments that first-year students have to make during the transition to college

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life. These challenges make it difficult for many freshman engineering students to find a balance between a rigorous curriculum with college life.

Peer mentoring has been viewed as one promising solution to the retention challenge. Previous studies have indicated that a student's first semester success can lay the groundwork for the attainment of an engineering degree [Budny et al., 4]. Peer mentoring can help a make a student's first semester successful through the early awareness of campus resources [Budny et al., 4]. Thus, peer mentoring programs have been adopted, with varying levels of success, at many colleges and universities across the country. The University of Arkansas attributed the success of their pilot peer mentoring program to several key factors: proper mentor selection, mentor training, freshman mentee training, proper mentor/mentee matching, weekly targeted one-on-one meetings with mentees, well timed information and mentee support, proper referrals, group mentee social activities, and mentor handbook development [Gattis et al., 1]. While the engineering peer mentoring program at Virginia Tech has many of these elements, it differs in that it is of much larger scale, and is also led by peers. Evidence to support mentoring programs has been documented but few studies have sought to identify strategies for improving delivery [Hall, 5]. Through the use of peer leaders, our program hopes to formulate a strategy for improving the delivery of mentoring to first year students.

The implementation of a multiple peer leadership model took place for the fall 2009 semester at Virginia Tech. Since the expansion of the mentoring program in 2005, which provided an opportunity for all freshman engineering students at Virginia Tech to be mentored, it has been difficult for a single administrative faculty member to facilitate the program. Shifting leadership of the peer mentoring program from a single facilitator to a peer led model allowed veteran mentor students to network and share their past experiences to help guide both new and returning mentors while simultaneously coping with the expansion of the program

The purpose of this study is to assess the relative success of the transition from a single facilitator model to a peer leader model. The following questions are addressed:

1. What are the perceived differences between the two models?
2. How has the peer led model met the needs of the mentors, mentees and the program as a whole?

Program Structure

In 2004 the Center for the Enhancement of Engineering Diversity (CEED) was awarded a National Science Foundation STEM Talent Expansion Program (STEP) grant. The STEP grant provided funding to expand the existing CEED peer mentoring efforts of the Academic Hispanic OutReach Alliance (AHORA), Black Engineering Support Teams (BEST), and Women in Engineering Support Teams (WEST). Beginning in August 2005, the expanded efforts included the General Undergraduate Engineering Support Teams (GUEST) and the Network for Engineering Transfer Students (NETS) [Watford et al., 6]. These programs aimed to provide the opportunity for all first-year College of Engineering students to be matched with a peer mentor from a select group of upper-division College of Engineering students. Mentors served as resources for academic issues, assisted in the development of academic and professional skills, and acted as a sounding board for new thoughts and ideas. With 404 active mentees and 65 mentors, the CEED mentoring programs were part of an on-going effort to create a support network to increase the retention of first-year freshmen and transfer students into the College of Engineering.

CEED Mentors are expected to meet with their mentees at least once a week. This meeting often doubles as a social outing or meal; however, the primary purpose is to provide an open forum for the mentees to discuss their progress and concerns. The location and timing of this meeting is open for the mentors to decide with their individual mentoring teams, but having a meal together has proven to be a successful venue. In addition to these regular meetings, mentors are provided with $18 per mentee to fund off-campus meals as social gatherings. Mentors are suggested to spread this allowance over three meals, one during each month of the program. Finally, two large

group socials are organized by the CEED office which brings all five programs together. These social events are designed to foster a sense of community amongst the programs.

Outside of running their individual teams, mentors are required to attend a weekly, hour-long seminar, run by the peer leaders, which serves as an open forum for the mentors to discuss problems, successes, and upcoming events. In addition to attending the seminar, mentors are required to submit brief weekly reports that summarize the activities of their group during the past week. Once per month, a larger report, which details the individual progress of each mentee in a group, is required providing a more detailed description of each group's progress. These reports are designed to allow the mentors to share problems, concerns, and successes with the peer leaders, who read all of the reports and provide feedback to the mentors.

Methods

Setting and Participants

The setting for this assessment was a first-year engineering peer mentoring program at Virginia Tech. This program employed approximately 65 mentors, 32 new mentors and 33 veteran mentors, who were upper-division engineering students from a variety of engineering departments. The program catered to 404 first-year freshman and transfer engineering students. All mentors from the 2009 program were invited to participate in the focus group. To ensure both new and returning mentors were present, six students were selected from the volunteers; four male and two female mentors, and four having participated for multiple years of the program.

Data Collection

The principal data sources for this formative assessment was a focus group conducted with a subset of new and returning mentors. Permission to solicit the participants for the focus group was obtained through human subjects (IRB) review. During the last few weeks of the fall semester, all mentors who had participated in the 2009 program were invited to interview regarding their experiences under the new system. Six students agreed to participate, and written consent was obtained to audio record the interview for clarification and accuracy of direct quotations. The focus group was conducted by two members of the research team who had not worked with the mentoring program during the assessment period, but one had experience with the program in past years. A semi-structured set of questions, available from the first author, was used to guide the focus group discussion.

Data Analysis

An open coding method was used to systematically analyze the data and arrive at conclusions [Strauss, Corbin, 7]. Upon completion of the focus group, a written transcript was created to begin analysis. The authors developed an initial visual representation of the coding scheme. This visual representation was created to help group the interview comments into general categories, and to help determine the relationships between them. During the second stage of coding, specific quotes from the mentors were grouped to establish a better understanding of the underlying themes and the commonalities between them. From this analysis, three modified themes evolved, including: networking among the mentors, nature of available feedback, and organizational flow of the program. These themes and supporting categories are shown in Table 1.

Table 1. Coding Scheme for Mentoring Program Data

Networking	o Personal interaction o Group and class sizes
Feedback	o Process of providing feedback o Timing of available feedback o Quality of feedback
Organizational Flow	o Seminar outline o Small versus large mentor groups o Coordination among peer leaders o Information dissemination and storage

These themes are developed and discussed further in the following section.

Findings

Qualitative results obtained from an hour long focus group have aided in the evaluation of the peer-led peer mentoring program. Important feedback was discussed regarding the networking, feedback, and organization and flow of the peer mentoring program. Comparisons were made with the past single-facilitator model to ultimately determine the best way to promote networking, organize the program and seminar, and provide feedback to each mentor.

Networking

Networking is an important aspect of any peer mentoring program. Each mentor brings with him or her a unique set of skills and experiences which allows for diverse opinions and experiences to be shared with other mentors and subsequently other mentees through successful mentor networking. In a program of this scale, there are several networking relationships which are formed. These include mentor to mentee, mentor to mentor, mentor to peer leader and peer leader to administrator. Under the single facilitator model, there is a smaller networking map with a more direct relationship between the administrator and the mentors.

Under the single facilitator model, mentors had the opportunity to network with each other as well as the administrative faculty member. As the program grew in size, the relationship between the administrator and the mentors became strained due to the increasing demands on the administrator; however, a female returning mentor commented that, "[The single facilitator] would get to know me as a person relatively well by the end of the semester." Another returning mentor commented that, "[the single facilitator] was really able to get one-on-one and customize [the program to] what was going on." This relationship between the administrator led to a sense of community between the mentors.

Despite the positive relationship that formed between the mentors and the single facilitator, a returning mentor commented that it was desirable to hear multiple opinions on a single issue brought up during seminar. More specifically, "with the peer leader model, you could have different solutions to the same problem…[and] they (the peer leaders) each had a different experience [to share from their time as a mentor]."

As with any peer mentoring program, sensitive topics were part of weekly conversation with mentees. As a result, mentors often commented on these subjects during the weekly seminar to hear other mentors' opinions on the situations. In such situations, mentors have commented that they felt more comfortable talking about sensitive subjects with the peer leaders than they did with the administrative faculty member due to proximity in age. For example, a returning mentor commented that, "with the peer leader model…people felt pretty free about what they could discuss in class…because people may have felt more comfortable talking to people their age, as opposed to bringing [a sensitive topic] up with [the single administrator]."

In addition to feeling more comfortable discussing sensitive topics, returning mentors had the ability to share and guide new mentors through their first experience as a mentor, having been a mentor themselves. The success of this relationship was a driver behind the implementation of the peer leader model with the aim of developing a strong peer leader to mentor relationship which would carry through to the mentees. Unfortunately, mentors felt that under this new model the program was not as personal in previous years. A returning mentor felt that, "[the peer leaders] just didn't know me as well by the end of the process as [the single facilitator] did."

Under the peer leader model, in an attempt to foster the peer leader-mentor relationship, small groups were formed during seminar to allow for open, small group discussion. This was to allow everyone to have an opportunity to share experiences and opinions, especially those who were reluctant to share during the large group meeting. In order to promote networking, the small groups and peer leaders were rotated each week to allow everyone to share with new mentors every week. Unfortunately, this rotation led to the loss of the personal feel because the peer leaders were dealing with new issues, and new mentors, every week. Consistently meeting with the same small group each week would help to solidify the network by allowing each group to track new and reoccurring issues each week.

To promote networking amongst teams and mentees, it was suggested that mentors join with another mentor's group when meeting. A mentor's group was formed by participants' housing arrangements and accordingly, groups often were comprised of people who either lived together or very close in the same residence hall. A returning mentor commented that, "I saw a lot of them having contact outside of the group...and that makes group function just a little easier." In order to encourage networking outside of these groups, a mentor suggested that, joining multiple groups together, despite the scheduling difficulties, would be a great way to encourage mentee participation in the meetings and also foster an extended mentee communication network.

Feedback

In the CEED peer mentoring program, feedback has always been important to ensure that each mentor's questions and concerns regarding his/her mentees are answered. The process for providing feedback to the mentors varied between the single facilitator model and the peer leader model. The main characteristics to determine the effectiveness of the feedback were quality, timing, and consistency. Feedback was provided to the mentors through reports submitted to either the peer leaders or the single facilitator on a weekly basis. Weekly reports were submitted each week, with the exception of a monthly report that was submitted on the first week of each month. The weekly reports were shorter, as a summary was submitted for the mentoring group as a whole. The monthly reports were more extensive, as a summary was submitted for each mentee in each mentoring group.

Under both the single facilitator model and the peer leader model, written reports were submitted on a weekly basis. When the single facilitator model was in use, the facilitator would annotate reports that were handed in by the mentors each week. As was stated by a returning mentor, the single facilitator would "literally take a pen and write on your paper comments about your report."

As the same person was commenting on the reports every week, an advantage of the single facilitator model was that it promoted consistency in the feedback; the single facilitator was able to "follow [the question or concern] from week to week and see how it was going." Another advantage of the model was that the quality of feedback was high. It was stated that comments received by the single facilitator were "constructive" and detailed."

The disadvantage of report feedback under the single facilitator model was the timeliness of the feedback. As only one person graded the reports each week, this person would grade 80 or more reports, which was a very time consuming process. A returning mentor commented that, "typically, [the mentors would] get the weekly reports back every [recitation] time, but [the single facilitator] sometimes got a little behind on the monthly reports, which were a lot more for [the single facilitator] to read." To address issues as they arose, prompt feedback on written weekly and monthly reports was key, and the peer leader model provided this quick feedback as reports were

submitted electronically via the website Scholar. Each of the peer leaders would electronically annotate reports that were handed in by a set number of mentors each week.

Initially, there was an issue with timing of the feedback, as the website Scholar was new to everyone in the program. A returning mentor commented that, "once the system was working, the feedback on the reports was much better, in that it came in a timely manner. You were able to see a response within a couple of days of writing the report." The quality of the feedback under the peer leader model was also good, and a returning mentor noted that "the peer leaders had a more direct answer every time" because they had the past experience of being mentors and of being first-year engineering students at one point in time.

In an effort to foster networking, the weekly reports divided amongst the peer leaders were different each week; however, because of this rotation the feedback lacked consistency. Returning mentors noted that the feedback came from a "different person each time [and sometimes] a concept kind of got lost in that someone might read the second report and [the mentor] says that [they] fixed the issue, [but the peer leader] would have no clue what the issue was because they didn't see the report the week before."

Organizational Flow

Overall the focus group was satisfied with many aspects of the program organization and flow, but they identified several areas that can be improved. While most of the ideas stemmed from their past experience under the single facilitator model, there were several great suggestions for future improvements.

The general outline of the weekly seminar used during the 2009 school year was to open with announcements from the peer leaders and ask if any mentors had any announcements to add. This was followed by dividing the mentors into small groups to discuss successes and failures and any other relevant mentoring topics. Finally, a closing large group session was used to discuss anything that came up in small groups or any final announcements before concluding seminar.

Under the single facilitator model, much of this schedule was organized and overseen by a single person and this required a great deal of preparatory work by the single facilitator. After the switch to the peer leader model, several returning mentors commented that some of this organizational structure was lost due to the multiple leaders. A new mentor commented that, "I don't know if it is necessary to have all of the peer leaders standing up at the front every week." Additionally, a returning mentor commented that, "it was a little chaotic…with 90 [65] people and 6 leaders, and it just could have been a lot more streamlined."

The focus group suggested that the peer leaders coordinate the agenda to keep a steady flow. In the past, the seminar agenda was written on the board; however, during the peer leader model, the agenda was on a piece of paper for the leaders to use as a guide. A returning mentor noted that, "having an agenda or list…up on the board [would be beneficial] so [the mentors] know what points we're going to hit on [during the seminar]." With a clearly defined agenda, mentors would be able to formulate ideas and comments and contribute more to the discussions. In addition, it will help prevent the meeting from digressing by allowing mentors and leaders to keep each other focused on the meeting goals.

In addition to improving the seminar organization, the group emphasized that the online course management tool also needed to be more organized. In the past, everything from final reports to weekly announcements was done on paper. This year, the peer leader model used Scholar, the university's web-based course management system, to streamline the process. The group emphasized that Scholar was unorganized and difficult to navigate; however much of this trouble stemmed from fact that Scholar is a new tool for the University, and much of this year was spent learning how to effectively and efficiently leverage the tools on Scholar. A returning mentor commented that, "Scholar was kind of difficult. I know that the resources were available…[but] trying to find [them was often] difficult." The group suggested reorganizing the Scholar site to make it easier to navigate. Additionally, it was

suggested that seminar minutes, or an outline of what was discussed during seminar, should be recorded and posted on Scholar under a special tab for future reference. In addition, the use of forums for specific topics should be created and easily located.

Conclusions/Recommendations

Many suggestions were presented during the focus group meeting that, if implemented, should improve networking, feedback, and organization and flow under the peer leader model to create a more beneficial program for all participants of the program. Changes listed below include the formation of a more detailed agenda for weekly seminars, a buddy system for new mentors, improved organization and consistency in written feedback and small group discussions, and a reworking of the online course management site used in program facilitation.

Program changes/updates:

- **Small Group Consistency** – In order to promote networking and allow for more constructive small group conversation, pre-defined small groups will meet with the same peer leader each week throughout the program.
- **Feedback Consistency** – In order to allow for more consistent and useful feedback, the same peer leader will read and reply to the same written reports each week. These groups will be different than those used for small group discussion in seminar to promote networking and the sharing of multiple opinions.
    - **Report Template** – Structured weekly and monthly report templates will be developed to help new mentors as well as help the peer leaders provide more constructive feedback.
- **Buddy System –** To allow for new mentors to feel more prepared at the beginning of the semester and provide a leadership opportunity for returning mentors, each new mentor will be paired with a returning, experienced mentor to help with new hire questions and complications. This will foster mentor-mentor networking and potentially lead to group collaboration opportunities during the semester.
- **Peer Leader Rotation –** To provide a more organized large group discussion during seminar, a presentation rotation will be established among the peer leaders. A small subset of the peer leaders (1 or 2) will lead the discussion while the others sit in the audience and share comments only as needed. This will help with the flow and organization of seminar.
- **Agenda –** To help organize a more structured seminar, a clear agenda, as well as talking points for use during both small group and large group discussion will be displayed in a place that all of the mentors can see. This format should help with the flow of the seminar as well as foster more meaningful conversation.
- **Scholar –** To improve the use of Scholar, the online course site will be improved and re-organized before the start of the next mentoring program. The Scholar site will contain specific forums and tabs with clear labels to make information and resources both easy to find and use. This change will not only help mentors locate the information but it will help peer leaders stay organized as well.

The large scale Peer Mentoring Program at Virginia Tech continues to evolve and improve each year. This focus group provided an important opportunity for the changes to be evaluated by a group of mentors and their feedback was collected and assessed. The six 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 2010 program.

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