
AC 2012-4662: CREATING A SUPPORT NETWORK FOR STUDENTS THROUGH A STUDENT-LED MENTORING PROGRAM

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Creating a Support Network for Students through a Student-Led Mentoring Program

Abstract

Mentoring programs at the college-level can occur in many forms. Some programs provide a mechanism for faculty and students to be engaged. Other programs work to link industry with current students. The purpose of most mentoring programs is to help increase the retention rate of students and provide a support network for them. To address these concerns, a mentoring program was started in the Aerospace Engineering Department at Texas A&M University to connect junior and senior level students to freshman and sophomore level students. The goals of the program are to: provide an understanding of what Aerospace Engineering is and possible applications and career paths; design and build fun and educational projects with students; provide advice on classes, professors, study habits, and general college life; host laboratory tours; discuss internships, research, and organizational involvement; handle tutoring sessions and office hours and motivate students about Aerospace Engineering.

This paper will provide a framework for starting a mentoring program at your institution. While this is not a new idea, the authors will discuss why the current structure was selected and other iterations that have been utilized. The role of a mentor and mentee and the expectations of each will be detailed. Example time lines, activities, and structure will be provided. In addition, potential struggles and past experiences will be shared, and strategies utilized to effectively overcome these will be discussed. Departments with current mentoring programs and those looking to begin a new one will discover practical, effective methods in this paper.

Background

The mentor program at Texas A&M University (TAMU) was first established nine years ago as a pairing between students and faculty members. In this iteration, little structure to the program existed. Students and faculty were paired, but no instructions were provided, criteria created, etc. For some students and/or faculty members, the program worked well, but most students and/or faculty members complained of lack of participation by the other. This program ended, and a new mentoring program was established three years later by a group of undergraduates who wanted to help other undergraduates make their way through the demanding curriculum in the aerospace program. With oversight by administration in the department, students created the mentoring program to help students in areas important to them during their time as a student.

A first step in creating a mentoring program is to determine the structure which will fit best with the current program¹. Two lessons learned from the initial iteration of the mentoring program involving faculty and students were the importance of someone providing oversight to the program and having expectations in place for each audience. An important part of the current

structure is the educational advisor from the department who will lead the group as well as a student who will take on the responsibility of communication between the mentors and the advisor. The current structure of the mentoring program in the Aerospace Engineering Department at TAMU is to elect a mentor chair as part of the board for the departmental honor society and have the mentor program be run by students. Oversight is then provided by the advisor of the organization, as well as administration in the department.

Identifying the right students to become mentors is also a key component of a successful mentoring program. Students who become mentors need to truly want to provide assistance and be a resource for younger students. Mentors need to also make sure they are encouraging the students to continue to pursue aerospace engineering rather than discouraging them from continuing due to current struggles they may be encountering in senior-level courses. Due to these past observations, the mentoring program now screens using an application. A good place to start looking for volunteers to mentor is through student organizations in your department or area. A few sample questions from the current mentor application at TAMU include:

1. How do you feel about your experience as a whole in the Aerospace Engineering Department at TAMU?
2. Why do you want to be a mentor, and why do you think you would make a good mentor?
3. What do you feel is the most important part of your college career (i.e. social aspects, research aspects, classes, internships, etc.)?

One program that was used to help create the current structure for the peer mentoring program is the Big Sis – Lil Sis program established by the Society of Women Engineers (SWE). In the SWE program, an upper classman or graduate student is paired with an underclassman. The mentors interact with their mentees through e-mail questions as well as at luncheons. Their program is also distributed through a wide variety of majors, so students do not always have a mentor in their specific area of interest. In addition, the program is focused on females and not widespread for all students. One of the differences in the TAMU program was to also include more of an interaction between mentors and mentees through learning.

Currently, the mentor program at TAMU has several methods of interacting with students including meeting with mentees during office hours, tutoring sessions, test reviews and in a freshman introductory course, Principles of Aerospace Engineering. The mentor program hosts office hours throughout the week for mentees to seek a one on one meeting with mentors to get help with homework or ask advice about minors, internships, co-ops, research opportunities, or other aerospace-related items. Tutoring sessions are held one evening each week for all aerospace students to obtain homework or problem solving help for any aerospace or related classes. The mentors also host test reviews before exams during midterms and finals for courses requested by students. Any sophomore or junior level courses are available for test reviews as well as a few senior level classes.

In the introductory course, the upper-class student mentor is assigned to one team consisting of approximately four students. Each team then works together to complete projects, homework assignments, and in-class discussions. By incorporating the mentor in this type of format, it allows the students to work with their mentor in different situations. Examples of activities used in this course include mentor to mentee group interviews, a student question and answer panel, designing stomp rockets, and senior design lab tours. A sample semester timeline can be found in Figure 1, where the red boxes signify the presence of mentors. One of the first activities the mentors did with the mentees was to attend class to introduce themselves to the mentees and to allow the freshmen to become familiar with whom to later ask for help. A homework assignment associated with this session included the students obtaining contact information for their mentor, getting their most pressing questions answered by an upper classman student, and learning more about the aerospace engineering program. While these items might seem trivial, over the years it has been found to be beneficial to have this type of structured assignment to start the program with easy access to the mentor’s information for follow-up purposes. Having consistent presence of the mentors throughout the class is also important. Students must see their mentors in different capacities to assist in making them feel more comfortable approaching their mentor as the semester continues. As shown in the figure, mentors also assist with class projects and attend educational field trips with the freshmen, such as trips to companies in the aerospace industry.

Week 1 <ul style="list-style-type: none"> • Introduction • Team Assignments 	Week 2 <ul style="list-style-type: none"> • Overview of Aerospace Engineering • Introduction to Mentors 	Week 3 <ul style="list-style-type: none"> • AERO Student Organizations 	Week 4 <ul style="list-style-type: none"> • Faculty Presentation • Mentor Social 	Week 5 <ul style="list-style-type: none"> • Faculty Presentation
Week 6 <ul style="list-style-type: none"> • Faculty Presentation 	Week 7 <ul style="list-style-type: none"> • Mentor Activity (Stomp Rockets) 	Week 8 <ul style="list-style-type: none"> • Honors – Industry Tour (SWRI) • Regular – Lab Tour 	Week 9 <ul style="list-style-type: none"> • Launch Stomp Rockets 	Week 10 <ul style="list-style-type: none"> • Lab Tour
Week 11 <ul style="list-style-type: none"> • Mentor Student Panel 	Week 12 <ul style="list-style-type: none"> • Guest Speaker 	Week 13 <ul style="list-style-type: none"> • Thanksgiving Holiday 	Week 14 <ul style="list-style-type: none"> • Senior Design Project Lab Tours – with Mentors 	Week 15 <ul style="list-style-type: none"> • Class Survey

Figure 1: Example Timeline from the introductory course, *Principles of Aerospace Engineering*.

Roles of the Mentor and Mentee

The roles of the mentor and mentee are very important, and these roles should be clearly explained to both participating parties. The role of a mentor is to provide positive help and guidance about the aerospace program. The mentor should provide experience-based examples from his or her time in the program as well as give advice about getting involved in research, co-ops, internships and student organizations. The mentors should motivate the mentees to continue along in the aerospace engineering curriculum and industry. The mentors, if used correctly, can be a very useful resource to the lower level students, even if all they do is direct them to the right point of contact for their needs. While the program does not currently provide mentors with training; many resources are provided should the mentors need help throughout the year. Currently the mentors at TAMU come from the departmental chapter of Sigma Gamma Tau (SGT), which is a national based aerospace engineering honor society. The role of a mentee is to seek advice and guidance from mentors who have successfully worked their way through the program. Mentees need to remain accessible and need to be open to learning, sharing and communicating. Communication between mentors and mentees should be facilitated both ways. While mentees should be open to learning and actively receiving information from the mentors, they also need to be willing to provide valid feedback to the mentors and the mentoring program to make sure needed improvements can be made. Both parties need to be motivated to participate in the program and maintain contact with each other².

Previous Struggles and Past Experiences

Past struggles in the development of the mentoring program at TAMU include a lack of willing mentors, mentors that do not provide positive feedback, lack of active participation from mentees, difficulty in finding educational activities that also keep the interest of mentees, and problems with other time commitments. In previous semesters, it has been difficult to find enough mentors such that each group in the introductory course can have a mentor, as well as finding enough volunteers to host office hours, tutoring, and exam review sessions. One way to find volunteers is to ask student organizations related to the field of study for volunteers. Adding incentives to the volunteers through the organizations, such as counting mentoring hours as participation hours in the organization, usually gains more willing volunteers. At this time, all mentoring has been done on a strictly volunteer basis.

Finding a good balance of the time required from a mentor and the mentees is difficult but is something that needs to be determined and possibly adjusted several times to find the perfect fit. The current program is still trying to discover that equilibrium with changes being implemented each year. It is difficult to find an amount of time that does not put a burden on the mentors but provides enough time to help the younger students. Previous classes indicated that they might like to meet with the mentors outside of class time in order to make them feel more comfortable around them and to give them the opportunity to ask more frank questions, etc. However, it is

very difficult to determine a time outside of class that both the students and the mentors are available. After hours can also be difficult due to many factors, such as work, review sessions and other extracurricular activities; therefore, the program has kept from mandating that all groups meet outside of the classroom.

Finding fun and educational activities is also a challenge. Past activities have included designing, building, and launching stomp rockets and egg drop planes and parachutes. In addition, an aerospace engineering related jeopardy / quiz game has been used. Working with students to develop related aerospace projects that might be utilized for K-12 outreach purposes was attempted this past semester. Further structure will be added to see if this might be a viable activity for mentors and mentees to do together.

Other ideas and past experiences include one on one mentoring between an upperclassman (junior, senior or graduate student) and an underclassman (freshman or sophomore); however this may cause a problem if you have a significantly larger number of underclassmen than upperclassmen, or just an uneven participation ratio. Mentors in previous iterations of the program where this was used found difficulty in getting active participation from the lower level students. There were usually more mentors than mentees that showed up for events. This problem could also be due to the fact that all activities were held during evening hours, whereas now the program tries to facilitate activities throughout the day hours with only tutoring and review sessions in the evenings. Figure 2 shows pictures from the Mentoring Social, where the students built hovercrafts in their mentoring groups.



Figure 2: Pictures from the introductory class mentoring social.

Results and Discussion

The current procedure for evaluation of the mentoring program is to survey the mentees in the program at the end of the semester about their opinions, comments, or concerns, using a Likert scale. This type of qualitative survey is used to score responses along a range. Previous surveys

have provided helpful feedback to the mentor administration staff, such as the importance of speaking to mentors before allowing them to mentor students and making sure they are going to provide positive guidance to the mentees. Surveys from the new design of the program show that most of the students find the mentoring program to be of value. It can be seen from Figure 3 that both the honors and regular sections of the introductory departmental course in 2011 found the mentoring program to be beneficial overall. The final survey also indicated that the mentoring program is not adequately advertising its tutoring services and office hours to the freshmen. Alterations need to be made to the existing media being used to advertise the many services of the mentor program. Suggestions include advertising in buildings that host freshman mathematics and science courses as well as more announcements during class and throughout the aerospace building.

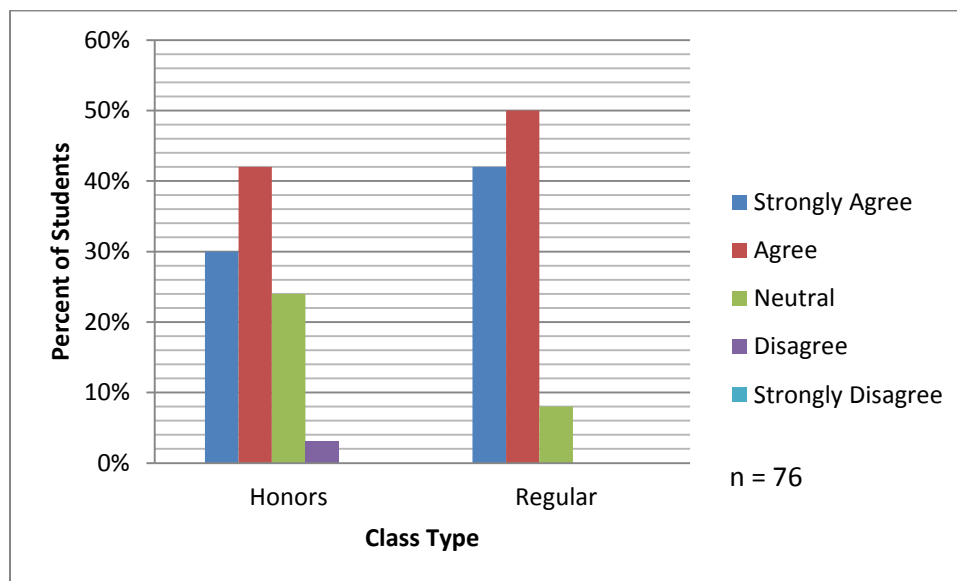


Figure 3: Survey question - Did you find the mentors to be helpful?

The surveys also show that only 18% of the honors section and 16% of the regular section were aware of the tutoring services offered by the mentoring program; however, there were no students in either class that took advantage of these services. As for the office hours provided by the mentoring program, only 29% and 21% of the honors and regular sections, respectively, visited the mentoring office. Office hours were more publicized, as approximately half of both classes said they knew about the availability of the mentoring program’s office hours.

Figure 4 shows the comparisons between 2010’s survey responses³ and 2011’s responses from the student panel, (a), and other mentor activities, (b). In order to address these concerns in the future, the first mentoring interaction should include a trip to visit the mentoring office, as well

as a handout for the students to keep with valuable information such as office location and the current semester’s office hours. The largest difference between the mentoring programs in these two years is the amount of time the mentors spent in the classroom with the students. In the previous year, the mentors were much less involved throughout the semester. The most common concerns from the AERO 101 students were “more involvement” and “more interaction outside of the classroom”.

Both years show that hearing from current AERO students on something, such as a student panel, is found to be more effective than other mentor activities, such as launching stomp rockets. One student in the introductory course commented on the student panel:

“Honestly, I felt it was pretty darn effective. Like when we had the open forum where the mentors would stand at the front of the class and allow us to bombard them with questions. That was really helpful and I can’t imagine it being any more effective than that.”

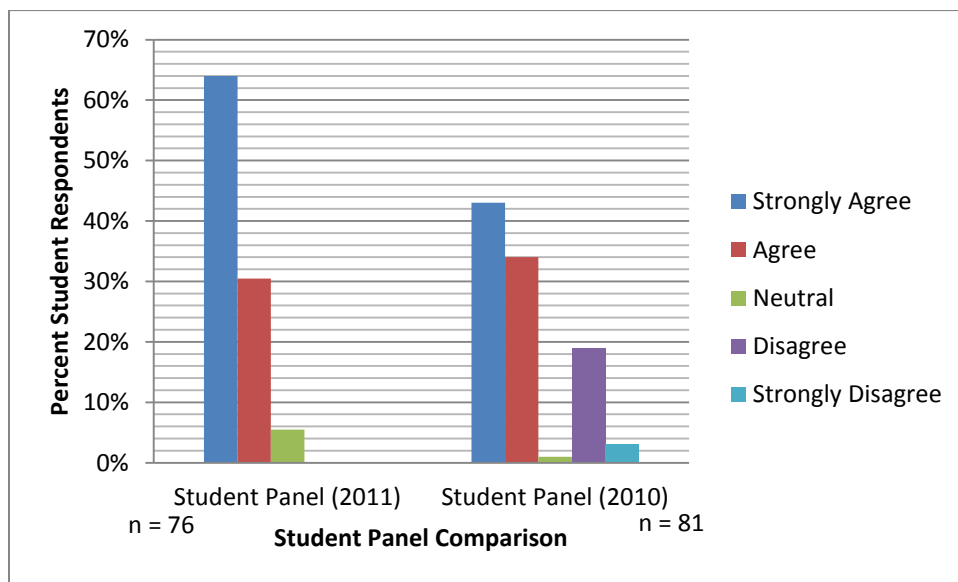


Figure 4a: Survey results from the introductory course from two years related to the student panel³.

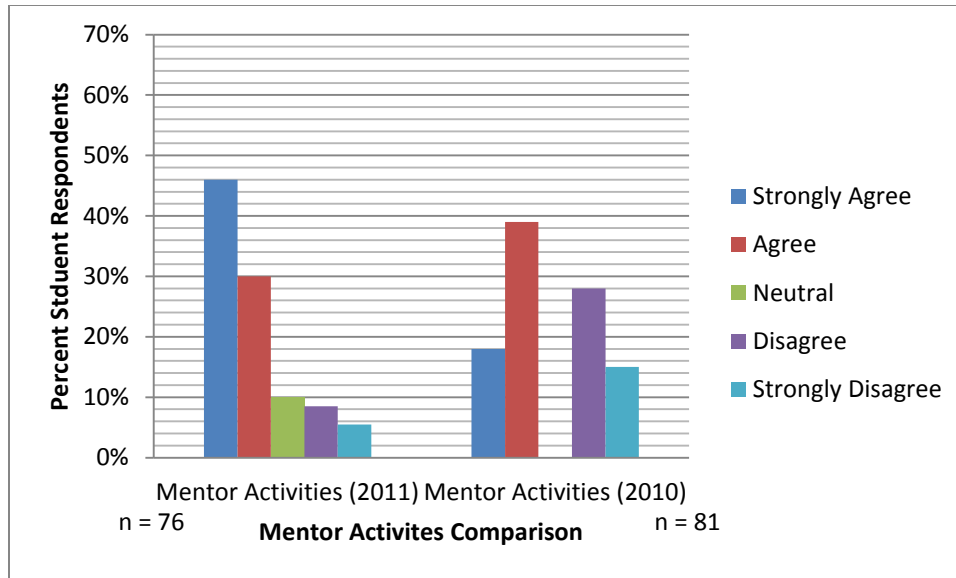


Figure 4b: Survey results from the introductory course from two years related to mentoring activities.

Conclusion

In conclusion, the mentoring program is ever evolving to find the right balance between mentors and mentees. Current work includes investigating the best way to incorporate faculty back into the program and even expanding the mentoring program to include a mentor for each sophomore and junior level course to help students who are struggling in said courses. The program would also like to find new ways to publicize the activities, so that all aerospace engineering students, especially freshmen, are aware of the activities and services provided. Survey statistics as well as anecdotal comments from students show the importance of the program in the education of the students and its valued need to students in the department.

References

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