

## **AC 2007-1971: THE ETHICS, LEADERSHIP AND ENTREPRENEURSHIP SEMINAR: HELPING STUDENTS TO BECOME LEADERS**

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# **The Ethics, Leadership, and Entrepreneurship Seminar: Helping Students to Become Leaders**

## **Abstract**

Recently, the Electronics and Telecommunications Engineering Technology (EET/TET) Programs at Texas A&M University have created a new undergraduate initiative in the area of entrepreneurship. The goals of the Engineering Entrepreneurship Education Experience (E4) are threefold:

- Excite and motivate undergraduate students to take ownership of their education by giving them opportunities to develop and market their own intellectual property.
- Retain the best and brightest undergraduate talent in the Brazos Valley region.
- Use entrepreneurship to help undergraduates develop ethical and leadership qualities.

The E4 initiative affords teams of students two semesters in which to develop an idea, plan their project, and implement a commercially viable product prototype. The most successful projects will be selected for an additional semester of business development incubation. However, it was quickly recognized that students needed access to experienced mentors who could guide and teach them as they transitioned through the E4 process. To this end, the Ethics, Leadership, and Entrepreneurship (ELE) Seminar was created.

The ELE Seminar is a one hour extension of the first course in the E4 sequence where regional industry and entrepreneurial leaders conduct weekly roundtable discussions on ethics, leadership and entrepreneurship. The format of the seminar inherently fosters leadership in the students. Each E4 team of students is required to recruit a speaker and help them select a topic. On the day of the seminar, the student group hosts their guest during the seminar and actively participates in the roundtable discussion. It is the responsibility of the team to ensure that the speaker stays on topic and that relevant questions are being asked. After the seminar, the student team takes their guest to dinner for follow-on discussions.

The seminar has now been conducted for two semesters and has been extremely successful. Guests have included Vice-Presidents from regional companies, a Houston-based venture capitalist, and the President of Texas A&M University. Several student teams have formed relationships with their guests and are having continued professional interactions. This paper will describe the ELE Seminar process, discuss specific guest examples, and relate the seminar to success in the E4 initiative.

## **Introduction**

With the implementation of the new outcomes-based TAC of ABET accreditation process, Engineering Technology programs are now required to integrate into the undergraduate educational experience relevant material focused on such topics as:

- An ability to understand professional, ethical, and social responsibility;
- A respect for diversity and a knowledge of contemporary professional, societal, and global issues, and;
- A commitment to quality, timeliness, and continuous improvement.

In addition to these topics, the EET/TET Programs have been expanding the typical senior design course into a two-semester capstone experience.<sup>1,2,3</sup> Over the past two years students enrolled in the sequence have been able to plan, design, and deliver fully functional prototypes of products ready for operational testing and assessment of their commercial viability. Based on the current success of this transformation, the programs are now proposing the Engineering Entrepreneurial Education Experience (E4) Initiative.<sup>4</sup> The goals of the (E4) are threefold:

- Excite and motivate undergraduate students to take ownership of their education by giving them opportunities to develop and market their own intellectual property.
- Retain the best and brightest undergraduate talent in the Brazos Valley region.
- Use entrepreneurship to help undergraduates develop ethical and leadership qualities.

This initiative, which has generated grant proposals to the NSF Partnership For Innovation and the National Collegiate Inventors and Innovators Alliance (NCIIA) E-Team programs, has as its vision the establishment of an engineering incubator on the main Texas A&M campus to support new venture start ups resulting from the products developed by EET/TET undergraduates in their capstone experience. These activities have, therefore, added another topic, Entrepreneurship, to the ones indicated above.

The EET/TET faculty members agreed that although each of these topics could be included in the typical courses, meeting the intent of ABET as well as providing a real-world view of entrepreneurship was not possible in the normal context of the technical course sequence. The faculty agreed that a new approach would be needed to successfully integrate these topics into the undergraduate experience.

To meet these new requirements, a small working group of industry representatives led by Mr. Marc Lockard, President and CEO of Lockard & White, and former/current students met with the faculty to brainstorm methods/approaches to address these topics. Consistent with methods used at other institutions<sup>5</sup>, the recommendation that came from this working group was to establish a seminar as part of the first course in the capstone sequence. The primary focus of the seminar would be in three areas – Ethics, Leadership, and Entrepreneurship, but the intent was to provide timely learning for the students through the real-world experiences of executive-level entrepreneurs and industry representatives. Other institutions have also recognized the importance of combining these topics in a seminar format.<sup>6</sup> The industry members of the working group also agreed to play a major role in the coordination and delivery of the seminars.

During the Spring 2006 semester, the first offering of the Ethics, Leadership, and Entrepreneurship (ELE) Seminar Series was offered as part of the capstone experience. The following sections of this paper describe the continuous improvement process of the seminar, including the benefit and value derived by the various stakeholders of the process. The paper also addresses examples of past seminar topics and speakers, as well as discussing the future of the seminar series.

## What Is ELE?

The ELE Seminar is a series of one-hour segments integrated into the first course in the Electronics and Telecommunications capstone sequence where regional industry and entrepreneurial leaders conduct roundtable discussions on ethics, leadership and entrepreneurship. During its first semester, two members of private industry agreed to assist in the coordination and delivery of the seminars. In so doing, topics were selected by the working group, and representatives from the private sector were identified and invited to participate. The working group then assigned a seminar guest speaker to a capstone team.

The structure of the seminar inherently fosters leadership in the students. In its first offering, each capstone team of students was required to contact the seminar guest to help refine the specific discussion topic. On the day of the seminar, the student team hosted the guest which included a tour of the campus. As part of the seminar the student team actively participated in a roundtable discussion lead by their guest. An example of the roundtable interaction between students and industry executive can be seen in Figure 1. Seated around this central area were the other teams that listened to the discussions and evaluated the educational benefit they received through the students' questions.



Figure 1. ELE Seminar Roundtable Discussion.

The guest was encouraged not to use a lecture approach, but rather to interact with the student team in a question/answer/discussion process. It was the responsibility of the team to ensure that the speaker stayed on topic and that relevant questions were asked. During the one-hour seminar, other student teams observed the discussion and then provided peer evaluations based on the overall quality of the seminar and the learning they extract from the discussions. Following the roundtable interaction, the seminar was opened for questions from the audience, thus allowing the other members of the class to interact with the guest. After the seminar, the student team escorted their guest to dinner for follow-on interaction. Because there were only

five capstone teams during the initial, Spring 2006, semester, each team was afforded the opportunity to host the seminar twice.

### **How is the Seminar Supported?**

As part of the strong endorsement of the seminar concept by industry, expenses incurred in hosting industry guests have been reimbursed by the private sector. Long term, it is envisioned that industry will provide an endowment capable of meeting the expenses of the seminar as well as funding a token of appreciation for the industry guest to increase awareness of the series within his or her company.

### **What is the Value of the Seminar?**

In addition to meeting the primary needs stated above, the seminar series provides a wide range of values – to the students, to the faculty, to the private sector participants, and to relationship building. First and foremost, the students are actively involved in the learning process as it deals with these three areas. As one student indicated “The opportunity to interact with a senior executive from the private sector was, in and of itself, valuable to me.” Another student indicated that she was still realizing the value of spending an afternoon with someone who had unique perspectives on what would be expected of her as she entered the workforce following graduation. A third student indicated the value of preparing for the seminar roundtable discussion. He felt that what he focused on and how he went about collecting information and background material on his team’s seminar leader would serve him well. One of the guests during the initial seminar series was Dr. Robert Gates, the former University President, who is well versed in interacting with groups of all sizes. One of his observations was, “I don’t believe I have ever participated in an educational experience where the students were so engaged and prepared to discuss a topic.”

Faculty members have found the seminar of value to them as well. Having the opportunity to expand their involvement with companies at the executive level adds significantly to creating new opportunities for interaction. As was clearly indicated by Dr. Roland Haden, former Dean of the Look College of Engineering, “the seminars fulfill a secondary role in allowing faculty and private/public sector visitors who are professionally registered engineers to meet a portion of their yearly continuing education requirements without leaving the Bryan/College Station area.”

One of the vice presidents of a major construction firm and former Texas A&M student, best summarized the value to the private sector in his comments, “I have been looking for a long time to find a way that I could give back to my University and have an impact on the education of young men and women. It is unreasonable to assume that I can be effective or in step with the latest design process or software language in a technical course, but having the opportunity to interact with and share the lessons I have learned over the past 40 years in the private sector is something I find extremely rewarding. The relationships I have made with my ELE host team have continued well beyond our time together interacting during our roundtable discussion.” Another industry visitor who has recruited numerous entry-level employees from the EET/TET Programs stated, “I am totally comfortable with the technical capabilities and toolbox that students leaving the Electronics and Telecommunications Programs have, but interacting with

them in this venue and being able to observe them in a non-traditional classroom setting gives me additional information about an individual's fit in my company.”

The dinner following the seminar has been a major forum for building new relationships. Some of the previous seminar leaders have continued to be involved in the series by “dropping in” on other seminars. Bringing individuals at this level together and facilitating the development of new relationships such as this will result in strategic benefits to the educational programs. Other relationships are being fostered through these seminars including those with the business community in the Brazos Valley and the Center for New Ventures and Entrepreneurship within the Mays School of Business.

The seminar format has added greatly to the entrepreneurial activities of the EET/TET Programs. Bringing practicing, self-made entrepreneurs to campus and having them share their experiences while learning about the interest the programs have in establishing an incubator that focuses on the extension of the undergraduate educational experience has been well received. These individuals have indicated a desire to help promote and mentor new business start-ups in the local area. As the EET/TET Programs move forward with their E4 proposals to NSF, NCIIA and other private sector funding sources, the ELE Seminar Series is one way to build a strong foundation of practitioners and to promote interaction with those that have been successful. Similar results have been achieved in the Mississippi State University engineering entrepreneurship program where they have combined a seminar series with a student design project experience.<sup>7</sup>

## **Lessons Learned**

Over the initial two semesters that the ELE Seminar Series has been offered there have been several lessons learned and improvements made to the administration of the educational experience. One of the most significant improvements has been in the level of engagement and responsibility of the student teams. In the first semester, industry and faculty members identified the specific topics and the guests. This process, although very efficient, created representation from a very narrowly focused industry segment that limited the range of experiences and viewpoints. In addition, the students were not fully engaged when a guest was assigned to them. Based on feedback from the first group of students, this process was changed for the second semester.

During Fall 2006, the student teams were given a task – identify, successfully invite, and host an executive-level individual to participate in a roundtable discussion on one or more of the primary focus areas. This somewhat minor change in the process produced significant enhancements in all aspects of the seminar. The buy-in to the entire process increased dramatically by assigning the responsibility to the capstone team to select a person that they were interested in hosting. They spent more effort in learning about the background and experiences of their guests. Through interaction with the individual they were able to fine tune the roundtable discussion through the questions they created. Even more importantly, the characteristics of the seminar guests expanded dramatically. Representation of women and other minorities was increased as well as expanding the diversity of experience. Seasoned executives from well established, large companies were counterbalanced with younger executives from new start up ventures.

Technology companies were contrasted with non-engineering companies. Private sector executive concepts and experiences were compared to those of military and public-sector leaders. The wide range of leaders that were invited by the students drove home the importance of the global aspects of business, the need for social awareness, and ethical behavior and norms beyond the borders of the US.

Due in a large degree to the students playing a pivotal role in the guest selection process, the caliber of questions and counterpoint discussion also experienced a major improvement. The teams spent additional time outside of the seminar doing research, brainstorming questions and developing an approach to managing their guest, and this preparation showed both in the peer evaluations of the value of the learning experience as well as the informal feedback received from the guests as to the breadth and depth of the questions and the ability to follow-up on a response with their own observations and experiences.

Another lesson learned was in the attendance of the seminar. While the series is open to all faculty, industry members, and students (invitations to faculty across the campus are sent out prior to each seminar), the intent is that at a minimum, the twenty to forty EET/TET students will attend each week. With this said, the value of faculty and industry guests to the question and answer process was quickly realized. Faculty and industry guests appropriate to the current topic were invited to sit at the roundtable and add value to the discussion. Students indicated that comments made by these “spur-of-the-moment” guests were often very important to the overall learning process. For this reason, the seminar is now held in setting large enough to accommodate the students and at least twenty additional guests.

## **Examples**

One guest speaker was a senior vice president for a major construction company. His experiences in fighting the Kuwaiti oil well fires that were started as part of a retreating military action set the stage for a real-world glimpse into leadership. Through the question and answer interaction, the host team compiled the following three nuggets of leadership:

Mistakes occur – you can’t avoid them;

How you respond to a mistake determines if it is a personal failure or a learning experience;

One learns more from his mistakes and his successes.

Now over a year after the student team hosted the seminar, each of the graduates continues to stay in contact with their guest. His impact on their lives and careers has far exceeded the expectations set by the EET/TET faculty. With the mentorship that has been provided, each of the team members has undergone an unprecedented learning experience.

As depicted in Figure 2, another interesting example was when Dr. Robert Gates was invited to lead the roundtable discussion. He immediately captured the attention of all students with his opening remark, “You are probably wondering what a person can tell you about ethical behavior whose former job was to lie to everyone outside the organization.” Little did these students know that in less than a year this university president would be called to Washington DC to serve as Secretary of Defense in the Bush Administration. How does one measure the impact and

learning opportunity that four undergraduate students had by sitting at the same table with this individual and being able to pick his brain for over an hour. It is highly doubtful that this team or any of the students that participated in that seminar will ever forget some of the important “take-aways” he provided, using vivid examples, on ethical behavior that included the following main points:

- Supervisors are responsible for the ethical training and conduct of their people
- Ethics is a top-down process – leaders set the standard by their actions
- CEO (person in charge) must always know where the mole is
- Identify wrong do-ers before they can do harm
- Ethics are dynamic



Figure 2. Capstone Team with Dr. Robert Gates.

The seminars that have been conducted by practicing entrepreneurs have been among the most interactive of all the roundtable discussions. Many of these have extended beyond the one-hour session with the industry guest responding to questions and comments from all of the teams. One of the most popular guests was a former student who is now one of the principles in and Chief Technology Officer for a small company in the Dallas area. As this company is now realizing significant growth and success in a fast growth market area, his comments and observations were very relevant to those students who were considering an entrepreneurial track following graduation. In another session, a gentlemen from a start-up architecture firm explained how it is possible to leave one company and go across the street and open another while remaining friends and doing business with his former employer. He was quick to point out that having your first customer before starting your business was one of his secrets to early success. Finally, a CEO of a local research and development firm that has been in business for several years truly captivated the students with his views on inventors, innovators, and entrepreneurs. He motivated all of the students with his encouragement to learn and practice the principles entrepreneurship whether in a large corporation or a small start-up venture. A direct result of having discussion leaders such as these who focus on entrepreneurship has been two-fold. First, students and teams are more motivated in their capstone experience, secondly, these teams are becoming more interested in and involved in the E4 Initiative being pursued by the EET/TET Programs.



## **Future Directions**

After two semesters of development and continuous improvement, the faculty members have fully endorsed the concept of the ELE Seminar Series and its ability to bring into the undergraduate curriculum a unique and stimulating opportunity for students to take charge of their learning experience. It is therefore the intent of EET/TET programs to continue the series and expand its scope. Some of the areas being considered include Intellectual Property and Business Start Up.

As more capstone teams complete the goal of producing a fully functional prototype, the need to protect the intellectual property continues to increase. One of the additional subject areas being considered is patent processes and protection. Several former students, who are now practicing patent lawyers in the Houston and Dallas areas, have indicated an interest in being the roundtable discussion leader on this topic.

Another area of increasing interest is business start up. Although several seminars deal with entrepreneurship, none currently speak to the skills required to support a new venture. Insight into these areas will provide valuable information for teams that could move forward under the E4 Initiative to launch their own business. This round table discussion would then be followed by a more in-depth short course that allows the capstone teams to understand basic business concepts and procedures while providing experience with cost-effective tools.

One of the more important next steps for the seminar is to identify and attract an endowment capable of covering the cost incurred which includes travel and parking reimbursement for the invited guest, dinner for the capstone team and their guest, and an appreciation gift. In addition, a funding source will be required to support the expansion of the current seminar series to include other students within the Engineering Technology and Industrial Distribution Department as well as the business students who work collaboratively with the EET/TET students.

In summary, the ELE Seminar Series continues to be an innovative way to bring the expertise and knowledge of practitioners with executive-level experience in the public or private sectors into the learning experience of undergraduate students. The concept is also addressing a series of educational objectives mandated by TAC of ABET for all engineering technology programs. The recent successful accreditation visit bodes well for this educational format being used to satisfy these mandatory program outcomes. The benefits are significant across the entire spectrum of stakeholders including students, faculty as well as the members of the public and private sectors that participate in the seminars. In addition, the relationships being created through the ELE Seminar are being leveraged to move the E4 initiative forward. Once sustained support is created through an endowment, the seminar series will be expanded in scope and offered to a larger group of students.

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