

## Formal Student Presentations: Two Views on One Simple Approach

Paul J. Wilder / Ronald F. DeMara / Michael W. Costello

University of Southern Mississippi / University of Central Florida / Litton Data Systems

### Abstract

Perspectives from two sources on an approach to the implementation of formal student presentations are discussed. The faculty view develops the justification and goals for the implementation, while the student view discusses the results and usefulness after the implementation. While many other possibilities exist, this is proposed as an example, which takes advantage of the multimedia capabilities of many of today's classrooms. Variations on this theme allow maximum flexibility for integration into a variety of technical programs. Using formal student presentations in the classroom improves the quality of senior project presentations.

### Faculty Perspective

#### Introduction

Today's business environment requires that employees not only provide adequate service to employers, but increasingly take the initiative in maintaining themselves as company resources rather than simply employees. One of the ways in which employees empower themselves to be resources is to demonstrate superior communication skills. Myers and Hudson<sup>1</sup> reported on recent graduates of technology programs, specifically their communication deficiencies and lack of ability to present material in a professional manner. The TAC of ABET<sup>2</sup> program criteria includes *written/oral report preparation/presentation*.

Unless communication skills are learned during an educational experience, the only place to find this training is on-the-job. The competitive nature of today's technical job environments require engineering technology programs to provide students the skills necessary to compete in current employment markets. Integrating a formal presentation into the classroom permits students the opportunity to practice the required skills in a design proposal or design review typical of industry.

#### Presentation Integration

While formal student presentations are not feasible in every classroom circumstance, they can be effective in the proper setting. In general, formal student presentations are less effective in lower level classes simply resulting from the

student's lack of foundational or base knowledge. As students progress through a program their core knowledge improves forming a basis for advanced work, including senior design projects. Upper level classes provide the perfect opportunity to integrate formal student presentations into a curriculum. While this integration calls on the student's core knowledge foundation, as well as developing their research skills, it provides the student the opportunity to experience the presentation environment. The rudiments learned in these formal presentations serve to prepare the students for the tasks of senior project presentations.

Traditionally, students in many programs are required to take an oral communications course. These courses often concentrate on the public speaking/speech aspects of communication, while neglecting the formal presentation issues of interest to the modern day industrial base. An effective means of providing students with exposure to the appropriate skills is essential for successful transition from academe to industry.

In fact, an effective approach to focusing student interest on current technical topics is to solicit project ideas from local businesses and industry. This also has two beneficial side effects. First, the proposing company can often provide the sample components or information required, in exchange for obtaining the design expertise of the students involved. Second, it provides direct exposure to potential employers for the students. This approach has been extremely successful at the University of Central Florida where a large number of industry participants return with additional projects semester after semester. The list of industrial participants includes software development companies, local libraries, and the Orlando Science Center.

#### Presentation Format

At the University of Southern Mississippi's Gulf Coast campus a simple approach is used to integrate student presentations into the classroom. Starting in the junior year student presentations, both formal and informal, are used as required material in selected courses. The instructions for two of these presentations are shown in Figures 1 and 2. The first type of presentation is the library project. Topics are restricted to appropriate course material. Current research is

critiqued for relevance and quality. This type of presentation facilitates learning of library research and information collection in support of presentation material. These presentations are informal and are delivered in a seminar format. This practice provides a base for the formal presentations in later courses.

The requirements for the formal presentations include, but are not limited to: a direct relation to current course material, proper business attire, and presentation duration of approximately 20 minutes. Students are strongly encouraged to use presentation software such as Microsoft Powerpoint. These formal presentations provide students with the necessary experience for senior project design reviews and prototype presentations.

### Issues and Concerns

Several concerns are apparent in this type of implementation. The large time requirement<sup>1</sup> to accomplish this in normal classroom environments may impact a class in two ways. First, the required time allotment is substantial. Second, dedicating a large block of class time to presentations disrupts the regular course material, reducing the amount covered. One approach to dealing with these issues is to distribute the activity incrementally throughout the semester which is appropriate for the formal presentations. First, a list of possible projects is provided to expedite the start of the process for the students, although all topics must be approved in advance. Next, students must prepare a one paragraph written Project Proposal that must include a conjecture which students will attempt to demonstrate. After approval, students perform their Literature Survey consisting of review pertinent articles and books. The students are then encouraged to develop analytical results (equations or design) or experimental results (simulations) to support their conjecture. To address the issue of requiring additional time to support the integration of these activities into the curriculum, students are encouraged to attend meetings with the instructor on a regular basis during office hours. In this way the instructor can carefully guide the presentation material to support the original course work to effectively replace the course material not covered with topics which are current or state-of-the-art.

### Results and Conclusion

The implementation of student presentations took place in the 1996-97 academic year. While only a short time has elapsed, some preliminary conclusions can be made. Students benefit by developing a sense of ownership with respect to a specific sub-topic. This increases their level of interest in learning this technical topic in particular, as well as the related material in the rest of course. Students also learn to critique their own understanding of technical concepts. Since they are aware that they will have to present on the topic and be open to random questions from the instructor and audience, the

students become self-motivated to critique their own knowledge. This provides a unique opportunity to develop the important engineering skill of self-assessment of technical soundness and correctness.

## Student Perspective

### Introduction

As industry moves toward the implementation of small *do everything* design teams, the role of the engineer has been forced to change to meet these changing demands. Today's engineer not only needs to be proficient at product design, but must also present ideas within design groups, promote ideas within the company, and interface with current and potential customers. An engineer's merit is no longer rated on the ability to manipulate data with an HP calculator. The role of the engineer has become that of designer, manager, salesman, negotiator, teacher, and so on. This increased responsibility creates additional support requirements that need to be addressed by the educational system.

### Industry

A typical week in the life of an engineer includes 3-5 meetings to discuss design approach, project progress (milestones), items of concern, deficiencies, projected problem areas and so forth. The primary goal of these meetings is to identify potential *show stoppers* and create resolutions as quickly as possible. This prevents small problems from becoming big problems and keeps everyone on the same track.

Ideally hardware design is completed prior to software development. However, the fiercely competitive nature within industry forces software development to begin during hardware design. Frequently, meetings occur between software developers and engineers. In order to prevent inefficiency and lost time due to misunderstandings between hardware and software engineers, it is critical for the engineer to present hardware designs clearly and concisely. This time savings equates to increased profit margins, on time deliveries, ultimately leading to future contracts in the form of repeat business.

Realizing that software developers do not typically have a strong hardware background, the importance of concise technical communication is crucial. The hardware designer must explain how a system works in terms that the software engineer can understand.

Today's customer demands more from the engineer. Previously, the customer was satisfied simply by being made aware of a product's features. Now the customer not only

wants to know the product's capabilities, but also demands to know how these capabilities will be implemented. The informed customer wants to know the *how* and *why*. Presentations previously conducted by marketing personnel are now coordinated through the engineering departments.

The engineer's ability to effectively present an idea or project has never been more important than today. No longer are professional presentations left to the corporate giants of industry. With the availability of professional presentation software, industry demands that all companies large and small provide professional presentations.

There is a growing trend within industry for companies to team up on large projects. Often, the engineer is tasked with presenting a design or specification to engineers from another company. The format and guidelines are normally discussed and compiled into a Statement of Work (SOW) or similar document. Frequently, a marketing counterpart for this type of presentation is unavailable. Typically, the engineer receives a copy of the SOW and a specific presentation assignment, leaving the individual with the task of preparing the assignment and its presentation. Although this aspect of the job is rarely discussed during the interview, it has become an assumed ability of the engineer.

### **Application**

Systems Test Engineers, as well as Design Engineers experience presentation requirements ranging from Hardware Specifications for engineers, to formal system training for US Navy personnel. Methods utilized were similar to those experienced in class presentations at the University of Southern Mississippi (USM).

Presentations conducted in various CET/EET classes ranged from formal presentations to discussions in table format. Engineers are involved with similar presentations in the work environment. At least once during each week, a *staff* meeting is conducted discussing company outlook and projects. These meetings include a discussion of events pertaining to all engineering staff within the department. As part of an informal *initiation* process, an engineer is put on the firing line during the first meeting attended after transferring into the design group. The experience that is gained by classroom presentations better prepares the engineering student for the transition into the workplace.

Usually some anxiety exists prior to a presentation. Previously experiencing these feelings helps to alleviate some of the stress and anxiety. Although the required speech course addresses many of the matters of a presentation, it does not cover the unique issues of an engineering presentation, such as addressing peers in a technical environment. Presentations

within the classroom build experiences that are useful throughout an engineer's career.

<sup>1</sup> Myers, John D., and Hudson, Kermit, *Industrial Advisory Committee Interaction: A Time for Engineering Technology to Listen*, Proceedings of the ASEE Southeastern Section Meeting, 1997

<sup>2</sup> Technology Accreditation Commission, Accreditation Board for Engineering and Technology, INC, *Criteria for Accrediting Programs in Engineering Technology*, 1997-98 Accreditation Cycle, November 2, 1996

#### Paul J. Wilder

Paul J. Wilder received a Bachelor of Science degree in Engineering from the University of Vermont in 1986 and a Master of Science degree in Computer Engineering from the University of Central Florida in 1996. He is currently the Computer and Electronics Engineering Technology program coordinator and an assistant professor of Engineering Technology at the University of Southern Mississippi's Gulf Coast campus in Gautier, Mississippi. From 1989-1991, he held a faculty position at Vermont Technical College in Randolph Center, Vermont. His research interests include multiprocessor design, multiport memory design and embedded microcontroller systems.

#### Ronald F. DeMara

Ronald F. DeMara is a full-time faculty member in the Electrical and Computer Engineering Department at the University of Central Florida. Dr. DeMara received a Bachelor of Science degree in Electrical Engineering from Lehigh University in 1987 and a Master of Science degree in Electrical Engineering from the University of Maryland in 1989. He received his doctorate degree in Computer Engineering from the University of Southern California in 1992. His research interests include parallel processing, computer architecture and memory system design.

#### Michael W. Costello

Michael W. Costello is a student within the Electronics Engineering Technology program at the University of Southern Mississippi. His expertise is in Naval Combat Systems. He is employed by Litton Data Systems as a design engineer. Prior to working at Litton, he was an electronics instructor and technician in the United States Navy for 11 years.