

THE VIRGINIA TECH / HONEYWELL INTERNATIONAL SUMMER MANAGEMENT COMMUNICATION SKILLS SUMMER PROGRAM FOR UNDERGRADUATE WOMEN IN ENGINEERING

Eric Pappas¹ and Dana Swartz²

Abstract – *The Materials Science and Engineering / Engineering Science and Mechanics Advanced Engineering Writing and Communications Program at Virginia Tech sponsors the Honeywell International / Virginia Tech Management Communication Skills Summer Program for Undergraduate Women in Engineering. The program prepares undergraduate engineering women from Virginia Tech for the more sophisticated responsibilities required of managers. This intensive five-week program includes 80 hours of instruction in technical writing, public speaking, interpersonal communications, creative and conceptual thinking, problem solving, conflict negotiation, workgroup leadership, ethics, decision-making, and management style. Those who have completed the program report a greater number of job offers and increased opportunities to enter management training programs and jobs that require managerial responsibilities.*

Index Terms – *Communications, Gender, Management, Women*

BACKGROUND

The Virginia Tech / Honeywell International Summer Management Communication Skills Summer Program for Undergraduate Women in Engineering was developed under the auspices of the Materials Science and Engineering / Engineering Science and Mechanics Advanced Writing and Communications Program ("Communications Program"). This program, originally developed as an undergraduate engineering writing program in 1993, has evolved from a simple writing effort to a workplace-modeled, discipline-specific writing and public speaking program, and further to a comprehensive integrated engineering communications program which includes instruction in such workplace topics as public speaking, interpersonal communications, teamwork, engineering ethics, diversity, critical and creative thinking, engineering design, management skills, and other professional topics. Instruction in writing and communications is integrated into eight Materials Science and Engineering (MSE) and six Engineering Science and Mechanics (ESM) classes over students' three years of study in the departments.

In 1997, Honeywell International (then AlliedSignal Corporation) funded a grant to create a summer management skills program for undergraduate women in engineering at Virginia Tech that utilized the instructional and faculty resources of the Communications Program. The Virginia Tech / Honeywell International Management Communication Skills Summer Program for Undergraduate Women in Engineering ("Management Skills Program") is now in its fourth year of operation.

INTRODUCTION

Women are underrepresented in the engineering workforce, especially in managerial and supervisory positions. This fact is not a result of women being unable to manage or supervise others effectively; it is simply a fact of life for a discipline that remains heavily male-dominated. While women have been entering the engineering workforce in greater numbers over the past decade, we await a similar report on trends in women's promotions. Helping undergraduate women develop and hone key management and communication skills makes them more likely to assume such positions.

The Management Skills Program philosophy rests on the premise that learning how to manage others is a natural extension of knowing oneself. The ability to manage others is, to a great degree, an acquired skill, one that develops and grows from an understanding one's self and others, and increases with practice, reflection, and evaluation.

The Management Skills Program has adopted a feminist approach to teaching managerial and leadership skills. We educate students about sexism in the workplace and help them develop a managerial style based on their understanding of the contemporary workplace and of their own skills and personalities, rather than helping them adopt "accepted approaches" that, of course, have been developed and practiced by men.

In short, this program is about personal empowerment: providing participants with the tools they need to develop an educational process that allows for continual personal and professional growth.

¹ Eric Pappas, Virginia Polytechnic Institute and State University, Materials Science and Engineering Communications Program Director, 12 Holden Hall, Blacksburg, VA 24061 epappas@vt.edu

² Dana Swartz, Virginia Polytechnic Institute and State University, Materials Science and Engineering Communications Program Assistant Director, 14 Holden Hall, Blacksburg, VA 24061 dswartz@vt.edu

Curriculum Discussion

PROGRAM DESCRIPTION

We choose participants based on recommendations from academic advisors and faculty members, entrance essays, and interviews. The individuals we choose must have a record of demonstrating excellent communications skills. Participants receive an \$800 stipend to cover living costs during the program so they can dedicate their time and interest to learning.

The program is scheduled to correspond with Virginia Tech's first summer session, though it is not offered for course credit. Participants attend approximately three hours of class per day (11am -- 2pm), and work independently and in work groups an additional fifteen hours per week. Participants complete a group project related to management in their engineering field. The program is limited to 10 students, with preference given to students who have completed 60 academic credits.

We use the following methods to teach the topics addressed in the program: writing, reflection, small and large group discussions, role plays, experiments with changing some academic and personal habits, assigned and participant-selected readings, lectures, and discussions with professionals working in the engineering management field.

Below is a very brief outline of the major topics we cover in the program. Instruction is offered in five general sections.

Introduction and Professional Writing

- 1) Management and Communication Skills
- 2) Writing Process
- 3) Writing Professional Documents

Public Speaking and Professional Presentations

- 1) Advanced Public Speaking
- 2) Multi-media and Computer Presentations
- 3) Group Presentations
- 4) Audience Analysis / Location Analysis

Managerial Skills / Individual Skills

- 1) Empowerment / Emotional Intelligence
- 2) Empathy
- 3) Listening Skills
- 4) Reflection
- 5) Personal Change
- 6) Management Style

Supervising Skills / Working with Others

- 1) Identifying a Process Style for the Group: Working Collaboratively
- 2) Change in Groups
- 3) Adopting New Managerial Skills

- 4) Listening Skills in Common Situations
- 5) Consensus Decision Making
- 6) Motivating People / Empowering Employees

Specific Managerial Skills

- 1) Critical and Creative Thinking
- 2) Problem Solving
- 3) Decision-Making
- 4) Managing Teams
- 5) Diversity Issues
- 6) Conflict Negotiation

In addition, we cover the following practical topics in a serendipitous manner or as they seem to grow out of our conversations.

Organizational Skills

- 1) Keeping a calendar / notebook
- 2) Keeping notes on events and meetings / documenting ideas and solutions
- 3) Taking time to plan every morning and afternoon
- 4) Being reflective
- 5) Making time for yourself
- 6) Clarifying oral arrangements in writing / clarifying written arrangements orally
- 7) Using informal written communications (assign, evaluate, be evaluated, compliment)

Finally, we offer instruction in some personal skills that leads participants to developing what we have termed a "professional persona," that is, an ethical and communicative way of doing business in the workplace.

- 1) Ethics (personal and professional)
- 2) Stress
- 3) Continual Self-improvement
- 4) Procedural Knowledge (how things work, how you fit in, and how to get things done)
- 5) Reflecting / Thinking / Writing as Thinking
- 6) Going Easy on Yourself
- 7) Fear of Failure
- 8) Change

One major skill we emphasize at all times during the program is "putting theory into practice." We teach participants methods for implementing, testing, and evaluating new skills in the workplace; building upon successes and failures, and continuing the management learning process.

MANAGEMENT PHILOSOPHY

Our management philosophy guides our instruction at every point during the program; participants need to understand

that effective managers know that managing is as much about thinking as it is about doing. Knowing and employing "proven" managerial practices does not automatically produce good management or productive employees (although many writers and managers seem to think so). Fifteen years of managerial consulting has taught one of us (E.P.) that employees are better judges of managers than are academicians or upper-level managers. Workers in many organizations feel alienated from management for some or all of the following reasons:

- 1) they do not consider themselves a part of the decision-making process;
- 2) they feel they have little or no access to leadership in the organization;
- 3) they feel unappreciated for the good work they do on the job;
- 4) they feel the feedback they receive is often only criticism, and rarely praise; and
- 5) they are not often consulted in the areas in which they are expert...the work they do every day.

The above facts indicate that many managers are deficient in the interpersonal skills and self-awareness necessary to enfranchise and empower those they supervise. Our approach requires a greater level of professional intimacy, a skill many managers lack because they have not invested in themselves or because they fear that getting too close to their employees undermines their "authority." Becoming a good manager requires developing excellent communication skills and a high degree of self-awareness and knowledge. In this way, managers must be good examples of professional behavior by continuing to grow and educate themselves, develop a high degree of empathy, be reflective on a regular basis, and allow the free-flow of communication and ideas among themselves and their employees. These interpersonal skills are the backbone of our approach to managing; if managers cannot embody and practice the qualities they ask of their employees, they will surely fall short of providing supportive and productive management.

The relationship between managers and employees needs to be based mutual care, trust, and consistency. Both managers and employees need to demonstrate a level of respect for each other; in effect, a level of "care" in maintaining and improving the working relationship and preserving a productive workplace atmosphere. A degree of personal trust is an obvious component of any productive and resilient relationship; and in this case, is necessary even for the most mundane business settings so that valuable human and physical resources are not lost. Consistency is the most important of these three qualities; without it, most everyone squanders an inordinate amount of time and energy trying to interpret each other's intentions, motivations, and feelings. This relationship is a manager's contract with

employees: a commitment to their continuing professional (and sometimes personal) evolution.

Becoming an effective supervisor requires growth and change, not just at one time until certain skills are achieved, but continuously. Entering into a process of self-awareness and self-improvement is the only truly effective method of continuous professional growth. Supervising and managing others requires skills that must be cultivated over time. This process requires self-criticism, reflection, and the acceptance of continual change.

How one sees one's self in the workplace is probably not always the way one is perceived by others. Simply using authority to supervise will produce both limited results and, most likely, unhappy employees who work below their capabilities. A supervisor ought to be a part of the group, the "first among equals," in order to gain employees' confidence and loyalty. Influencing others by being a good example will earn the respect of those supervised, rather than elicit obedience through fear.

Supervising is more about one's self than about those who are supervised. Managers set the tone for workplace relationships and serve as an example for interpersonal communications and professional behavior. Most often those who are supervised take their cues from their supervisors and will reflect the manager's professional and communications style, and the nature of their interpersonal interactions.

CONCLUSION

The Management Skills Program is an experimental effort that seeks to encourage the development of women's management potential through the education of female engineers in personal, professional, communication, and management skills. Industry has made it clear that women must prove themselves in workplace in order to compete with men. This program is one step in that direction.

ACKNOWLEDGMENT

This program has been made possible entirely through support and grants from Honeywell International Corporation. The authors welcome inquiries on the program.

AUTHORS

Eric Pappas (contact author)

Eric Pappas is currently the director of the Materials Science and Engineering / Engineering Science and Mechanics Advanced Engineering Writing and Communications Program in the College of Engineering at Virginia

Curriculum Discussion

Polytechnic Institute and State University (Virginia Tech). The program includes instruction in writing, public speaking, interpersonal and professional communications, management and leadership skills, engineering ethics, professional development, creative and conceptual thinking, and engineering design. In addition, Dr. Pappas is currently on the Virginia Tech Honors Program faculty and is a faculty fellow in the Center for Excellence in Undergraduate Teaching.

Dr. Pappas received a B.S. in Business and Economic Theory from Wagner College in New York City in 1972. In 1987, he received an M.A. in English and in 1990 an Ed.D. in English Education, both from Virginia Tech. He has been on the faculty of Virginia Tech since 1987.

MSE / ESM Communications Program, 213 Holden Hall, Virginia Tech, Blacksburg, VA 24061-0237. Phone: 540-231-5305. Fax: 540-231-8919.

epappas@vt.edu.

Dana Swartz

Dana Swartz is a Ph.D. student in the Department of Psychology at Virginia Tech. She is currently the Assistant Director of Materials Science and Engineering / Engineering Science and Mechanics Advanced Engineering Writing and Communications Program in the College of Engineering at Virginia Tech. She received her B.S. in psychology from Virginia Tech.

MSE / ESM Communications Program, 213 Holden Hall, Virginia Tech, Blacksburg, VA 24061-0237. Phone: 540-231-7520. Fax: 540-231-8919

dswartz@vt.edu