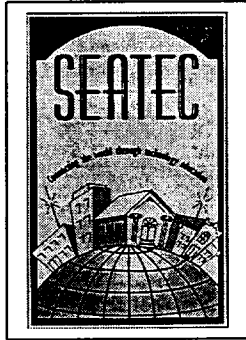


SEATEC: SouthEast Advanced Technology Education Consortium *

Deborah J. Hochstein / Neal F. Jackson
The University of Memphis / Jackson State Community College



Abstract

SEATEC is the collaborative effort of five Tennessee community colleges/technical institutes and their university, business and industry, and secondary school partners to pursue the development and enhancement of two-year programs in engineering technology. The consortium's activities, specifically the NSF-funded TEFATE project, and the benefits and opportunities realized are presented.

Introduction

In the fall 1993 representatives from six Tennessee community colleges/technical institutes met in Nashville to discuss methods and sources of funding to support the development of engineering technology programs. As a result of this initial meeting and much effort, the Southeast Advanced Technology Education Consortium (SEATEC) was created. The consortium has been very active and has experienced several changes in the last four years. Today, SEATEC remains a viable network of institutions and individuals that are combining their resources to pursue improvement in engineering technology programs.

The members of SEATEC currently are Chattanooga State Technical Community College (CSTCC), Jackson State Community College (JSCC), Nashville State Technical Institute (NSTI), Pellissippi State Technical Community College (PSTCC), and State Technical Institute at Memphis (STIM). Northeast State Technical Community College (NSTCC) was an active and supportive member from 1993

through 1996. The success of the consortium is due in large part to the partnerships established with regional universities, business and industry, and secondary schools.

Support of the National Science Foundation for two-year college initiatives through the Advanced Technological Education program (NSF/ATE) has been the basis for SEATEC's activities. The ATE program supports curriculum development and program improvement at the undergraduate and secondary school levels, specifically targeted at the education of technicians preparing for careers in high-tech areas. The majority of grants funded to date have been given to regional and diverse consortiums (3).

The primary goals of the SEATEC consortium are as follows:

- Reduce the lag time between the identification of emerging technology and the implementation of curricula in two-year colleges and secondary schools.
- Strengthen and continuously improve existing and new engineering technology curricula.
- Provide faculty training and development.
- Develop and enhance strong linkages between colleges and universities, secondary schools, business and industrial organizations, and government agencies.
- Promote minorities and women in the fields of engineering technology.

Participation in numerous discussions, meetings, conferences, workshops, and industry site visits describes how SEATEC has pursued its goals. The following is a summary of the results from the consortium's four-year history:

- Initial meeting at Nashville State Technical Institute – Fall 1993
- Submitted NSF/ATE planning grant proposal – Spring 1994
- Planning grant funded (\$50,000) – Fall 1994 to Fall 1995
- Submitted NSF/ATE Center proposal – January 1996
- Tennessee Exemplary Faculty for Advanced Technological Education (TEFATE) Project (\$449,594) – Fall 1996 to Fall 1998
(Center proposal not funded but resulted in funding for a two-year project)
- Submit NSF/ATE Center proposal – due October 1997

Development of telecommunications technology curriculum and programs has been used as the model for the TEFATE project and the center proposals.

TEFATE Project

Tennessee Exemplary Faculty for Advanced Technological Education (TEFATE) is the first project sponsored through SEATEC. It is based on the South Carolina Exemplary Faculty for Advanced Technological Education project and is in response to the Secretary's Commission for Achieving Necessary Skills (SCANS) report which states, "*We believe, after examining the findings of cognitive science, that the most effective way of teaching skills is 'in context'. Placing learning objectives within real environments is better than insisting that students learn in the abstract what they will then be expected to apply*" (5). The TEFATE project is using a holistic approach to curriculum development in support of the growing telecommunications technology industry. Interdisciplinary teams composed of academic partners and industrial partners from across the state of Tennessee and southeast region are implementing the project (See Table I). The activities sponsored through this project bring faculty face to face with prospective employers of their students and utilize much of the technology to be taught. This approach is intended to both link student learning to the workplace experience and facilitate modifying the curriculum as the telecommunication industry matures.

TEFATE Goals

The primary goal of this project is to develop a group of faculty who will provide leadership in telecommunications curriculum development. They are involved in activities which teach them about the nature of voice and data transmission using cable and fiber, and its application in industry today. They are gaining experience using this technology in teleconferencing, e-mail, etc. A secondary goal of the project is the development and dissemination of a clearly defined curriculum framework for telecommunications technician education at the Associate Degree level. This curriculum will be developed using nontraditional methodologies. This information will be used to (1) develop programs in telecommunications technology, (2) develop student and faculty work experience components in new technology curricula, and (3) identify work-based applications for use in classroom activities.

Faculty Development: While each member on a team may be considered an expert in their specific field, few if any possess all the skills required to develop the framework for a telecommunications technology program using an integrated approach between industry and academia, and cross-disciplinary departments. To achieve this goal the faculty development component of this project was divided into three objectives: (1) understanding curriculum

development techniques and practices; (2) gaining an appreciation and understanding of the telecommunications industry and how this particular technology is used in industry throughout the region; and (3) developing an understanding of cross disciplinary needs through successful team strategies.

The faculty member who first proposes a course traditionally develops the curriculum. The subject matter and delivery mechanisms are decided upon by that same person. The idea for the course may have come about as a result of his/her research, through trends in similar programs, ABET requirements, or advisory committee recommendations. Very seldom is a course developed specifically in response to the needs of industry. Consequently, most college technology faculty are unaware of various curriculum development methodologies. One objective of this project is to familiarize faculty with curriculum development methodologies, particularly those which assess and address the needs of industry. These activities include workshops on critical thinking tactics, writing across the curriculum strategies, and job and task analysis techniques associated with DACUM.

The telecommunications industry utilizes relatively new technology, and is growing and changing rapidly. In order for the participants of this project to develop the curriculum for a telecommunications program they must first learn about this new technology. Another objective of this project is to produce a pool of faculty, with technical and non-technical backgrounds, who can serve as a resource across the state in the development of future telecommunications programs through their understanding of the nature of telecommunications and its application. This is being achieved through seminars, industrial site visits, faculty internships with telecommunications industries, and selected readings (4).

Industry is calling for graduates who have the ability to work in teams and in response, faculty are attempting to incorporate team based activities in their courses. This endeavor is very difficult for many faculty who succeeded at learning in environments where team efforts were discouraged, and where students were expected to work alone and were rewarded as individuals. The participants in this project are learning the fundamentals of team building and working together on a team to produce a curriculum based product for telecommunications education. The diverse background of members on each team facilitates the integration of writing skills and mathematics skills with the technology skills. Members are learning to value the strengths of each of these disciplines. Team building activities include group discussions, associated workshops, and personality profiling techniques (2).

Development of Curriculum: The framework for the proposed telecommunications technology curriculum links the learning experience of the student to the anticipated workplace experience. Student activities will be structured to

SEATEC Members	University Partners	High School Partners	Business Partners
NSTI Sydney Rogers, Dean of Technologies and TEFATE Project Director Kurt Frederick, Grant Admin. Assistant Collin Balance, Grant Evaluation Ted Washington (PI), Head of CIS Charles Hoover, Computer Tech. Cindy Greenwood, Computer Tech. Claudia House, English Charles McSurdy, Math	Peter Romine, Engineering Tech. Alabama A & M University	Michael Crick, Vocational Tech. Hillwood High School	Ronnie Johnson, Manager Columbia/HCA Healthcare Corp.
CSTCC James Barrott (PI), Dean of E. T. Wayne Jones, E.T. Richard Seehuus, English Theresa Underwood, Math/Sciences Jo Ruta, Business & Info. Systems	no participant available	David Kindiger, Guid. Counselor Red Bank High School	James Hyatt, Elect. Engineer Tennessee Valley Authority
JSCC Neal Jackson (PI), Dean of Career Studies Mel Montgomery, E.E.T. Susan Randolph, Math Doug Teague, Business Linda Theus, Chair of CIS Mark Walls, English	William Call, E.E.T. Murray State University	Roy Weaver, Vo-Tech Director Jackson/Madison Cty. Schools	John Bentley, MIS Manager Touchstone Corporation Bill Montgomery, Director of Engr. Digital Telecommunications, Inc.
PSTCC Lisa Bogaty (PI), Director of New Programs Gail Burris, Assistant Professor Don Coffman, Elect. Engineering Karla Foss, Coordinator Tech. Math Gay Lyons, English	William Hemphill, M.E.T. David Tarnoff, E.E.T. East Tennessee State University Saleh Sbnaty, E.T. Middle Tennessee State Univ.	Nancy Witick, Lab Supervisor Farragut High School	C.J. McKinnis, Acct. Manager Sprint Corporation Jim Snyder, V.P. Bus. Dev. Tech 2020
STIM Margie Hobbs (PI), Professor of D.S. Dean Honadle, Telecommunications Marguerite Jackson-Jones, Dev. English Lisa Rudolph, Information Tech. Colathur Vijayan, Math	Deborah J. Hochstein, M.E.T. The University of Memphis	Le Duckworth, Curric. Coordinator Memphis City Schools	Bob Allen, Sen. Engr. Ops. Mgr. Time- Warner Communications Ray Ebner, Operations Mgr. MCI Telecommunications Corp.
Table I: TEFATE Project Organization			

help insure that they possess both the technical skills required to secure a job in the industry and the communications skills, (written and oral), to retain the job. Other aspects of "good" job performance as dictated by industry will be included such as work ethic, ability to adapt to new technologies or new environments, and life-long learning.

The link between the learning experience and workplace is being achieved three ways. First, each team has an industrial partner who has a direct affect on the curriculum as it is being designed. Secondly, all team members participate in industrial site visits at locations across the state of Tennessee. Through these visits faculty will be able to observe how the technology is being applied, and learn about technical and non-technical expectations of prospective employers. The associated interview process provides faculty with a resource person in the field should questions arise at a later date. Thirdly, each faculty is expected to participate in a two-week internship program. The extended time spent at one facility enables faculty to get an in-depth view of the telecommunications industry. The relationships developed through the internships are expected to continue after the project is completed will serve as a support mechanism for telecommunications technology programs.

The curriculum will be disseminated through three documents. The first document, Case Studies for Teaching Communications Technologies, will be a compilation of thirty-six case studies developed by teams across the state. A case study will detail a classroom or laboratory activity that can be used to teach non-technical as well as technical skills (1). The second document, Curriculum Framework Manual, will include a synthesis of the core competencies. The third document, Lessons and Guidelines for College/Industry Internships, will be prepared for use by colleges and universities interested in setting up industry internships for college instructors. The content will provide a "Do's and Don't" list for developing internship programs.

TEFATE Project Benefits

Completion of the TEFATE project will mark the first state wide initiative in telecommunications technology education aimed at the Associate Degree level. It is anticipated that the network of interaction between faculty at two-year technical colleges, four-year universities with technology programs, and secondary schools will continue after the project is completed. Much will have been learned about an emerging technology and its application in industry. Experience will be gained using unusual approaches to curriculum development such as, integrating different disciplines, realistic workplace experiences, critical thinking tactics, and job and task analysis techniques. The industrial contacts made throughout the two-year period will continue to foster communication in support of curriculum changes as the technology matures. Hopefully, the time it takes to modify curriculum to meet industry's changing needs will be reduced. Faculty will have gained experience participating as a team

member and will be better prepared to implement teambuilding activities in the classroom. Participants in this project will be prepared to take a leadership role in the implementation of new telecommunications technology programs or the redesign of existing programs.

Conclusions

SEATEC remains a viable network of institutions and individuals that are combining their resources to pursue improvement in engineering technology programs. A National Science Foundation ATE Center proposal will be submitted in October 1997. The members are optimistic about receiving a center grant. This three to five year grant will allow the consortium to increase and expand efforts in continuous improvement of engineering technology programs. Regardless of the outcome of this grant proposal, SEATEC will continue to refine and develop the network of faculty and industry partners and to pursue other sources of support to reach its goals.



This project was supported in part by a grant by the National Science Foundation(DUE-9602401). Opinions expressed are those of the authors and not necessarily of the Foundation.

Bibliography

1. Barrott, J. L. and Jackson, N. F., "Applying Case Studies in Engineering Technology Courses." Accepted for publication in *the 1998 ASEE National Conference Proceedings*, June 1998.
2. Covey, Stephen R., The Seven Habits of Highly Effective People. Simon and Schuster, 1989.
3. Directorate for Education and Human Resources, Advanced Technical Education: 1996 Awards and Activities (NSF 97-50), National Science Foundation, January 1997.
4. Negroponte, Nicholas, Being Digital. Random House, 1995.
5. Packer, Arnold, "What Mathematical Competencies Do Employers Want and How to Get Them." Improving Science, Mathematics, Engineering, and Technology Instruction, pp. 41-51. Community College Press, 1996.

NEAL JACKSON

Neal Jackson graduated from The University of Memphis in 1977 with a B.S.E.T. in Manufacturing. He earned an M.S. in Operations Management from The University of Arkansas in 1981 and is currently ABD in Production and Operations Management at The University of Mississippi. He is the Dean of Career Studies at Jackson State Community College and Co-PI of the NSF TEFATE Project.

DEBORAH HOCHSTEIN

Deborah Hochstein graduated from Georgian Court College in 1976 with a B.S. in Physics. She earned an M.S. in Engineering from The University of Akron in 1984. She serves as the Coordinator for Manufacturing Engineering Technology at The University of Memphis. She is a university representative on the NSF TEFATE Project.