

One-Stop Shopping for Engineering Technology Educators

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Abstract

The two-year college engineering technology community has a new central resource for ideas, materials, and technical assistance for improving engineering technology education. The SC ATE National Resource Center for Engineering Technology Education provides a specific link to the following:

- Materials developed for a new national image and marketing campaign to promote ET careers (Sinclair Community College);
- Videos, web sites, and workshops designed as tools to recruit learners, educate policymakers, and encourage expanded involvement of business and industry in ET education (WGBH public television); and,
- Workshops available to help faculty incorporate continuous quality improvement principles into ET education (ABET).

In addition, a "one-stop shopping" web site for accessing best practices and exemplary materials for recruiting and retaining students, as well as for teaching engineering technology, is available. An ad hoc committee of engineering technology educators is helping to build this centralized resource for the two-year college ET community.

Introduction

Lew Platt of Hewlett-Packett once observed, "Whatever made you successful in the past won't in the future."¹ Or as John L. Chambers of Cisco Systems has said, "We have to face the difficult challenge of changing when things are going well."² Certainly in the marketplace and even in education, we have seen that organizations must be flexible, constantly evolving in response to changing expectations and demands--not just to maintain the status quo but also to survive and flourish. Products, services, or curricula that are meeting our needs today may not be relevant in five years--or next semester. Engineering technology educators can benefit from a central point of contact for locating information to help with a myriad of challenges:

- Far too few high-quality engineering technicians are being produced, with means that more students need to be recruited and retained through to graduation.³
- Employers are demanding highly skilled technicians with strong teamwork, communications and problem-solving skills.⁴
- A clearer connection needs to be made between the skills taught in the classroom and the

skills needed in the workplace.⁵

- Appropriate teaching methods--based on the latest learning theory research--need to be used to meet the learning needs of all students.⁶
- Colleges must be prepared to adapt to ABET's new accreditation criteria.

A linked network of resources can help ET educators monitor emerging trends, new research, best practices, and innovative approaches to ensure the success of students and institutions, and, in turn, help support the success of our industrial and business communities. To find these valuable resources individually would take extensive time, a commodity often in short supply. However, working collaboratively through a central source, a vital network can be created. Through the National Science Foundation's ATE program, solutions to many of these challenges are being found and new resources developed. A central point of contact will help link these solutions and resources to the institutions that need them.

The two-year college engineering technology community has a new central contact for improving engineering technology education: the National Resource Center for Engineering Technology Education based in Florence, SC. The National Resource Center is a part of the South Carolina Advanced Technological Education (SC ATE) Center of Excellence, funded in part by the National Science Foundation, Florence-Darlington Technical College (Florence-Darlington Technical College), and Piedmont Technical College (Greenwood, SC). The Center can provide an important link in the ET community by:

- Serving as a clearinghouse for ideas, materials, best practices, and technical assistance dedicated to increasing the quantity, quality, and diversity of engineering technology graduates nationwide.
- Providing mentoring for college administrators addressing organizational change issues.
- Providing mentoring for faculty engaged in implementing more effective teaching strategies and curricula.

In this age of instant communications and super-centers to meet every need, the SC ATE National Resource Center will provide engineering technology educators with one source for "one-stop shopping" to help instructors and administrators find what they need, when they need it. Information is provided on four sample resources for ET educators: marketing, broadcast resources, continuous improvement, and web site access to additional resources. The SC ATE Center will focus first on innovations from the National Science Foundation ATE program as it builds this centralized National Resource Center.

One-stop shopping for marketing

The Image and Marketing of Engineering Technology Education (IMETE) project of Sinclair Community College has two primary objectives: piloting the newly created Engineering Technology Education (ETE) marketing materials through three test sites and assessing the effectiveness of the materials. The three pilot sites are the SC ATE Center of Excellence (pilot colleges are Florence-Darlington and Piedmont Technical Colleges), Middlesex County Community College, and the University of Central Florida.

An initial marketing workshop was held to help pilot colleges prepare for, launch, and track an engineering technology marketing campaign using IMETE marketing tools. The marketing tools were designed to generate awareness and excitement about engineering technology, leading to additional numbers of contacts with potential students and ultimately additional students and graduates. Marketing pieces include an ETE web site, video, posters, postcards, outdoor advertising, newspaper advertising, high school program advertising, and movie theater advertising.

Targeted audiences for the marketing campaign include high school students, working adults, and industries.⁷

One-stop marketing for broadcast resources

Produced by the education foundation for Boston public television station WGBH, *Pathways to Technology* will showcase a diverse range of innovative two-year college ATE projects through media-based products. These products will assist two-year colleges in recruiting students, educating policymakers, and encouraging expanded involvement of business and industry. Planned projects include five 15-minute videotapes on effective ATE projects as described by students and an introductory video and CD-ROM providing an overview of ATE goals and objectives. A web site will expand on the topics addressed in the videos and provide additional text information, interactive activities, streamed clips from the video series, and links to related sites.

The video series, web site and other materials are to be available for distribution in January 2004.

Pathways to Technology is produced in collaboration with the American Association of Community Colleges.⁸

One-stop shopping for continuous improvement

The Accreditation Board for Engineering and Technology (ABET) is conducting regional workshops for engineering technology faculty. The goal of ABET's Technological Education Initiative (TEI) is to promote continuous quality improvement in technological education programs throughout the country.

Through the workshops, ABET seeks to:

- Develop an awareness of learning-outcomes-based program development.
- Develop an awareness of the meaning and linkages among program educational objectives, programs outcomes, assessment, evaluation, and constituencies.
- Develop an awareness of a variety of assessment tools and their respective features, assets, utility, relevance, and limitations.
- Illustrate the structures and cyclic nature of planning, implementation, assessment, evaluation, feedback, and change in a continuous quality improvement environment.

TEI partners include the South Carolina ATE Center of Excellence, the Northeast Center for Telecommunications Technologies (NCTT), the Advanced Integrated Manufacturing Center (AIM), and New Jersey Center for Advanced Technological Education (NJCATE), and the Global Wireless Education Consortium (SWEC).⁹

One-stop shopping for web access to resources

The South Carolina ATE (SC ATE) Center of Excellence is designing a new web site that will facilitate "one-stop shopping" for accessing best practices and exemplary materials for recruiting and retaining students, as well as for teaching engineering technology.¹⁰ SC ATE makes available to the two-year engineering technology community the following resources:

- Technology Gateway curriculum, a pre-engineering technology curriculum for high school or slightly under-prepared college students.
- Engineering Technology Core (ET Core) curriculum, a general education component for engineering technology majors.
- Twenty-two workplace-related modules in the Technology Gateway and ET Core curricula.
- Integrated, problem-based courses of study. The SC ATE approach teaches physics, mathematics, communications, and engineering technology concurrently in the context of solving multiple workplace-related problems.
- Collaborative/active learning strategies.
- Interdisciplinary faculty team development.
- Methods of using student teams to facilitate learning and student retention.
- Innovative industry partnership model (SC ATE Scholars Initiative).
- Instructional approaches that support the success of a diverse population of learners and are focused on the recruitment, retention, and graduation of more highly skilled technicians.
- Recruitment and retention research and best practices, including a retention monograph.¹¹
- Marketing and career awareness resources.
- Links to NSF-supported projects offering curricula, faculty development, partnership initiatives, recruitment strategies, and other useful models, processes, and products available to the ET community.

Building for the future

Creating "one-stop shopping" for engineering technology educators is an ambitious and exhilarating undertaking. With input from peers, the SC ATE resource center can help educators locate resources to address common challenges and assist in successfully preparing a new generation of engineering technicians for the world of work. Irving Berlin said, "The toughest thing about success is that you've got to keep on being a success."¹² Those who rest on achievements of the past are sure to be left behind, as access to new information and technologies explodes around us and new challenges mount. It is time to step back and regroup, time to look to colleagues through a central resource of innovative research and practice. A National Resource Center for Engineering Technology Education will allow each of us to benefit from the strength and wisdom of the other. It is time for the building to begin!

Bibliography

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⁸ *Pathways to Technology: The Community College Route, Project Summary*, WGBH, Boston Public Television.

⁹ Weiss, M., Weeks, P. and Pagano, M. (2002), *ABET's Technological Education Initiative: Focus on Faculty*, American Society for Engineering Education Annual Conference & Exposition.

¹⁰ <http://scate.org>, South Carolina Advanced Technological Education Center of Excellence, National Resource Center for Engineering Technology Education.

¹¹ *Monograph: Recruitment & Retention of Engineering and Technology Students*, (2000), South Carolina Advanced Technological Education Center of Excellence.

¹² Boone, L. E. (1999). *Quotable Business*, Random House, Inc., New York, p. 115.

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