
EDITORIAL

We wish all our readers a happy and prosperous 2002.

The future of our Nation depends on having a strong, competitive science and engineering base and a workforce and citizenry equipped to function in a complex scientific world. To achieve this, educational excellence in mathematics and science at all levels must be a major goal, not simply to promote the health of science and engineering, but also to enhance every American's life opportunities through productive employment, active citizenship, and continuous learning. In pursuit of this goal, a core need is for all students - particularly those who have not traditionally participated in the fields of science, mathematics, engineering, and technology (SMET) - to have the opportunity to acquire the knowledge and skills that flow from teaching and learning based on high expectations linked to world-class standards. The future well-being of our country depends not only on how well we educate our children generally, but on how well we educate them in mathematics and science specifically (NSF, Math and Science Partnership, RFP NSF-02-061).

This journal provides peer-reviewed instructional materials that can be used directly to enhance the classroom-learning experience of students. In addition, we report articles that are cross-disciplinary in nature, thus disseminating educational innovations and experiences and helping SMET instructors share and learn from each other.

In this issue, we publish three articles and one case study. Unfortunately, due to the time it took for reviews to be completed and articles accepted, we have been forced to combine issues 3 and 4 of volume 2.

In the first article, James Powlik and Norman Fortenberry describe some educational experiments sponsored by NSF that use video, film, and computer-enhanced animation to improve teaching methods and, accordingly, learning outcomes. They discuss how it is the instructor's duty to use video, film, or animation, not only for technology's sake but to identify the best methodology, and place the lesson in the most rewarding context for the student. They also portray a generalized model to conceptualize the process that would be useful for developers of such technologies.

Gangbing Song and Paul Lam provide a simple but effective classroom demonstration in their article for students to learn about how piezoelectric ceramics are used as both smart sensors and smart actuators to study the dynamics and response of a simple dynamic system – a cantilevered flexible beam. They found that the demonstrations helped bridge the gap between theory and intuition and motivated students to pursue studies in smart structures.

Karl-Heinz Rau and Chetan S. Sankar present a case study that shows the strategic issues faced by the Chief Information Officer of Robert Bosch GmbH, and its U.S. subsidiary, Robert Bosch USA. The corporation was implementing SAP R/3 in order to standardize information systems for use in every plant location using a top-down approach. The Board was concerned that the current implementation of information systems was not acceptable and did not meet corporate requirements. This put pressure on the Chief Information Officer of the U.S. operations. He was unsure as to which of the information technology solutions would be most effective in coping with the growing and changing business of RBUS. We expect that use of this case study in your class would expose your students to the problems typically facing large multi-national companies when they attempt to standardize their operations and information systems.

In the next article, Amy Michel Roskowski, Richard M. Felder, and Lisa G. Bullard report on the student resistance to instructional technology and describe a successful approach to overcoming it. This article rounds up the issue very well, showing that it is possible to put education in pictures (as discussed in the Powlik and Fortenberry article), but course instructors have to be brought in as partners and given explicit guidelines and training in order to entice the students to use the instructional technologies. The innovative instructional materials and articles reported by all the authors in this issue provide us with an information base that we can all learn from and improve upon to excel in our profession. Please let us know how you are using effective new methodologies in your classrooms and share your experiences by sending in your innovative articles.

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