



WINTER 2011

From the Editor

This is our seventh issue of *Advances in Engineering Education*, and it is one filled with quality, peer-reviewed papers. In addition to three regular papers, it includes six papers that form a special section on eLearning. That section was guest edited by Maura Borrego, Euan Lindsay, and Krishna Madhavan and resulted in part from a National Science Foundation funded workshop held in conjunction with the Australasian Association for Engineering Education conference in Adelaide in December 2009. That workshop brought together ten participants from the U.S., ten from Australia and two from New Zealand – one result is this collection of papers.

Let's quickly pre-review the three regular papers which provide models for faculty in terms of reducing cheating in the classroom, collaboration between journalism and engineering students, and enhancing the quality of graduate students in a laboratory environment.

Lisa Bullard's and Adam Melvin's paper – “Using a Role-Play Video to Convey Expectations about Academic Integrity” addresses an issue of concern to all classroom instructors. They document how their instructional video that uses role-play to illustrate the differences between acceptable behavior and cheating on assignments has substantially reduced the average percentage of students who were caught cheating and appealed the faculty's accusation to the campus Judicial Board from 24% pre-video to 1% post-video. They have concluded that the video made students aware of what constitutes cheating, may reduce the incidence of cheating, and increases the likelihood that students who are caught cheating will admit their fault and accept the penalty.

Lydia Kavanagh's and John Cokley's article – “A Learning Collaboration Between Engineering And Journalism Undergraduate Students Prompts Interdisciplinary Behavior,” describes how senior engineering and journalism undergraduate students have collaborated in a multimedia design and communication project. The involved students reported increased media communication skills, an awareness of the necessity of communicating with other disciplines, and some change in their intended strategies for future projects. In addition, there was a high level of student satisfaction with the collaboration.

Monica Cox and five colleagues from Purdue University have written “Enhancing the Quality of Engineering Graduate Teaching Assistants through Multidimensional Feedback.” They describe the Global Real-time Assessment Teaching Tool for Teaching Enhancement (G-RATE) framed around the “How People Learn” framework and informed from data collected through laboratory observations; focus group interviews with supervisors and graduate teaching assistants; and undergraduate student surveys. The G-RATE allows administrators, graduate teaching assistants, undergraduate



students, and researchers to provide feedback about the pedagogical practices of graduate teaching assistants within a laboratory session which should result in improved laboratory experience as well as improved training of graduate students.

The six papers in the eLearning section also cover a wide spectrum of applications, while providing engineering educators with important insights into how to most effectively use eLearning in the classroom.

Rosemary Chang together with six colleagues from five different U.S. and Australian universities developed a paper as a result of the conference on “Practitioner Reflections on Engineering Students’ Engagement with e-Learning.” Their paper describes an investigation of student engagement with e-learning, using reflections from five faculty as a lens. Each uses e-learning as a way of promoting both classroom learning and engagement in their classrooms. Their collective reflections show that, although e-learning can be used as a tool to promote different types of engagement, the actual students’ engagement evolved beyond what the practitioners had intended or anticipated.

Priya Goeser’s, Wayne Johnson’s, Felix Hamza-Lup’s and Dirk Schaefer’s paper – “VIEW – A Virtual Interactive Web-based Learning Environment for Engineering: uses a 3D virtual, interactive, student-centered, framework of web-based modules to improve student success and learning. They describe an experimental study’s findings that showed students could meet given learning objectives with limited difference in their learning and performance in either a physical or virtual setting.

Kathryn Jablokow and Pamela Vercellone-Smith focus on “The Impact of Cognitive Style on Social Networks In On-Line Discussions.” They propose that as e-Learning is more prevalent in engineering education, understanding the impact of individual differences on how students communicate and collaborate on-line becomes more important. They investigate the influence of cognitive style on the interactions within student social networks in an on-line learning environment, with a particular focus on student engagement, patterns of communication, and the self-directed creation of sub-groups. They found that highly heterogeneous style composition of student cliques suggests that e-Learning environments may mask cognitive differences that have been shown to create conflict in face-to-face student interactions.

Tershia Pinder-Grover’s, Katie Green’s and Joanna Mirecki Millunchick’s article is on “The Efficacy Of Screencasts To Address The Diverse Academic Needs Of Students In A Large Lecture Course.” They propose that instructors can use such instructional technology, particularly screencasts, to supplement the lecture with content that addresses differences in students’ academic backgrounds, motivation, and interests, to improve the classroom experience, and reach individualized student needs. Their results indicate that students perceived the screencasts to be helpful and tended to use these resources as a study supplement. Overall, screencast usage was positively and significantly correlated with course performance as indicated by the final grade. Of note - the most substantial



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gains were found for students with the least amount of prior exposure to the course concepts, indicating the potential for screencasts to address academic in a large lecture environment.

Briano D. Collier, David J. Shernoff and Anna D., Strati have written "Measuring Engagement as Students Learn Dynamic Systems and Control with a Video Game" that presents results of a multi-year quasi-experimental study of student engagement in which a video game was introduced into an undergraduate dynamic systems and control course. The game, *EduTorcs*, provided challenges in which students devised control algorithms for virtual cars and bikes through a simulated game environment. They compared engagement and other experiential measures in before the game was introduced and in the year when the game was first fully implemented. Results suggest that students who took the experimental course experienced higher intrinsic motivation, positive affect and overall student engagement during their game-based homework and labwork than students taking the course in the control year who did not play the game. Students in the experimental year were also significantly more likely to consider their coursework as both work *and* play, a primary characteristic of flow experiences, than students in the control year who perceived coursework to be "like work."

Eric Wiebe, Theodore Branoff and Mark Shreve presentation - "Online Resource Utilization in a Hybrid Course in Engineering Graphics" focuses on an instructional innovation the development of a blended - online and face-to-face - introductory engineering graphics course. They present an in-depth analysis of how students make use of online resources to supplement the in class instructional support. An important finding is that the Moodle logging tools are a powerful way for instructors to gather and analyze data on how students use the online resources. This provides instructors with better information to use in the redesign of course materials in order to aid students learning. Since the production of the multimedia learning resources is a labor-intensive, this formative data provides evidence as to whether such material is being used by students and whether it provides real educational value.