

Editorial

Welcome to the Journal of STEM Education: Innovations and Research, Volume 11, Issues 1 & 2! I am pleased to present six articles in this issue. Most focus on undergraduate recruitment and retention in STEM majors. All present exciting research currently being conducted in STEM Education.

First, I would like to thank Dr. Stephen Turns for his contribution to this issue. He has provided our guest editorial on an important topic for all of us, entitled “What Motivates Your Teaching?” I had the pleasure of working with Dr. Turns when he spent part of his sabbatical at my Laboratory for Innovative Technology and Engineering Education (LITEE) at Auburn University in Fall 2009. This paper came out of a lecture he delivered to our LITEE research group and mechanical engineering students and faculty.

Our first article, “Mentoring in Cooperative Education and Internships: Preparing Protégés for STEM Professions,” by Matt Fifolt and Linda Searby, presents findings of a mixed-methods study measuring student perceptions of mentoring in a cooperative education program. The authors identify key skill sets, knowledge, and dispositions that protégés need to get the most out of their co-op experiences and makes suggestions for incorporating protégé preparation into cooperative education programs.

Next, “Course-Integrated Undergraduate Research Experiences Structured at Different Levels of Inquiry,” by Louis S. Nadelson, Linda Walters, and Jane Waterman examines three approaches to integrating undergraduate research experiences reflecting three different “levels of inquiry.” Students' cognitive and affective gains were measured and compared across these three approaches, and all were found to be effective in achieving learning goals and in increasing students' interest in STEM fields. However, differences in perceived gains indicated that students who participated in research experiences with higher levels of independent inquiry perceived greater gains in knowledge and understanding of scientific methods than those who participated in experiences with more directed levels of inquiry.

Then, in “Academic Success for STEM and Non-STEM Majors,” Donald F. Whalen and Mack C. Shelley, II discuss predictive variables for retention and graduation in STEM majors vs. non-STEM majors. The study examines how retention and graduation is affected by cumulative grade point average, financial need, financial aid, gender, ethnicity, on- or off-campus living arrangements, high school rank, ACT composite scores, out-of-state residence, and status in a STEM or non-STEM major.

The next article, “High School Bridge Program: A Multidisciplinary STEM Research Program,” by Jiang Zhe, Dennis Doverspike, Julie Zhao, Paul Lam and Craig Menzemer, presents a pilot study of a STEM Summer Bridge Program for high school students. The paper details the program and presents findings from focus groups that suggest that the program positively impacted students' career plans and decisions to pursue STEM majors in college.

Next, in “MemphiSTEP: A STEM Talent Expansion Program at the University of Memphis,” David Russomanno, Rachel Best, Stephanie Ivey, John R. Haddock, Don Franceschetti and Regina J. Hairston detail a five-year STEM Talent Expansion Program at the University of Memphis. The project's goals include STEM major retention and recruitment and persistence to graduation. This paper focuses on assessment results for the first summer of one component of the program, a Mathematics Bridge Bootcamp designed to ease college freshman's transition into college mathematics classes. It also describes how other program activities are designed to achieve program goals and details successes and lessons learned from the first year of the program.

The final article, “Teaching Math Problem Solving Using a Web-based Tutoring System, Learning Games, and Students' Writing,” by Robert W. Maloy, Sharon A. Edwards, and Gordon Anderson, details the usage of a web-based mathematics tutoring system by teachers in three rural Massachusetts school districts. The paper describes how the tutoring system evolved from its original purpose in order to better serve the 125 fourth graders using the program. It also presents an analysis of pre- and post-test performances by the students, indicating that 70 percent of students increased their pre- to post-test performance.

I hope you enjoy these articles and find them informative as I have. As the semester comes to a close, take some time to reflect on your own motivations for teaching. Happy Spring!

P.K. Raju
Editor-in-Chief