

Dear Colleagues,

I hope that all of our readers had an enjoyable holiday season, and that 2012 is full of exciting, enjoyable experiences for all, both personally and professionally. Here at the Institute for STEM Education and Research, the new year brings us Volume 13, Issue 1 of the *Journal of STEM Education*. This issue contains six articles that contribute to our ability to prepare and engage students in STEM classes—an ability that ultimately helps attract and retain students in these crucial and profitable fields.

First, Brock Barry contributes a very informative guest editorial about “Professional ethics in the STEM disciplines.” He reminds us of the impact STEM practitioners’ decisions can have in the real world, and therefore how important it is that these practitioners have the ability to make ethical decisions. Since this is a weighty subject, and sometimes a difficult one to teach, Dr. Barry shares here his knowledge of the many resources available to STEM educators to assist in bringing lessons on professional ethics into the classroom.

Next, Dunbar P. Birnie, III, David M. Kaz, and Elena A. Berman share a detailed description of a successful, repeatable hands-on design project in “Solar collector design optimization: A hands-on project case study.” They provide suggestions for how to implement this project in any undergraduate class, including possible variations of—and improvements to—their initial attempt.

Then, “Promoting engineering education among high school and middle school students” by Rohitha Goonatilake and Rafic A. Bachnak addresses the need to attract and retain students in STEM fields in the U.S. The authors explain a summer program at Texas A&M International University that was held to inform students about the opportunities and advantages available to STEM majors.

Joan Raines also tackles the issue of retention in “FirstSTEP: A preliminary review of the effects of a summer bridge program on pre-college STEM majors.” She relates the data compiled after a pre-college summer program designed to better prepare students entering STEM fields for college, in hopes that they will then succeed academically and graduate. Her study offers some interesting and positive conclusions about the effects of such programs.

In “Critical features and value in assessing a research experience for undergraduates: The case of Engineering Cities,” David Urias, Patricia Gallagher, and Joseph Wartman enlighten us regarding formal assessment of research experiences for undergraduates. In this case study based on their own experience with program assessment, they propose several steps involved in the process and describe the potential it has to improve students’ experiences.

Audrey C. Rule and Greg P. Stefanich, in “Using a thinking skills system to guide discussions during a working conference on students with disabilities pursuing STEM fields,” discuss the results of their attempt to prepare teachers to encourage students with disabilities in the STEM subjects. Their article describes their use of the ten Breadth thinking skills, which led teachers at a short conference to broaden their perceptions of students with disabilities and generate new ideas for building these students’ confidence and skills in STEM subjects.

Finally, in “Depth of Teachers’ Knowledge: Frameworks for Teachers’ Knowledge of Mathematics,” Vicki-Lynn Holmes describes seven teacher knowledge frameworks and relates them to mathematics knowledge of elementary school teachers. Through these frameworks, educators can build a common vocabulary; through better understanding of how to educate future math teachers, we can increase the preparedness of students entering STEM fields, building their skills at every level.

I believe this issue contains several interesting and relevant studies that STEM educators can adapt and apply throughout this promising new year. As always, we welcome comments, questions, and suggestions at jstemed@gmail.com. I wish you all the best as we begin the new semester.

Regards,
P.K. Raju
Editor-in-Chief