

## Editorial

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Dear Colleagues,

We are delighted to present you with another issue of the *Journal of STEM Education: Innovations and Research*. This issue contains much recent and relevant research that we hope you will find informative and useful in your classrooms. This issue incorporates a variety of that discuss STEM education research at several levels, including the middle school, high school, undergraduate, and graduate levels.

In “Using the Discipline of Agricultural Engineering to Integrate Math and Science,” Tim Foutz, Maria Navarro, Roger B. Hill, Kathy Miller, Sidney A. Thompson, and Deborah Riddleberger discuss an interdisciplinary effort to incorporate project-based learning into a math and science curriculum. Teachers used an agricultural theme to integrate math and science horizontally and vertically across the middle- and high school curricula. The program significantly improved test scores and grades among the students.

Louis S. Nadelson and Janet Callahan discuss outreach programs in “A Comparison of Two Engineering Outreach Programs for Adolescents.” Their study examines the impact of two residential engineering outreach events on the participants’ perceptions and attitudes about college in addition to their perceptions and attitudes about engineering.

In “Minority Students Severely Underrepresented in Science, Technology Engineering and Math,” Simeon P. Slovacek, Alan R. Peterfreund Glenn D. Kuehn, Jonathan C. Whittinghill, Susan Tucker, Kenneth A. Rath, and Yvonne G. Reinke discuss the declining rate of underrepresented minorities receiving PhDs in STEM fields and examine intervention programs across three universities. These programs are a part of the Minority Opportunities in Research Division of the Institute of General Medical Sciences.

Jennifer Wilhelm, Xiaobo She, and Darrellee Clem Morrison, in “Differences in Math and Science Understanding between NSF GK-12 Participant Groups: A Year Long Study,” examine graduate fellows and teachers in a year-long study designed to compare differences in mathematics and science efficacy and content understanding between the groups. Midyear and post test results showed a significant difference between groups on mathematics domains.

In “Teaching Continuum Mechanics in a Mechanical Engineering Program,” Yucheng Liu argues for continuum mechanics as a course for graduate-level students. The article describes the course and demonstrates that first-year graduate students who took the course went on to succeed in doctoral qualifying exams.

Finally, in “Assessing Student Scientific Expression Using Media: The Media-Enhanced Science Presentation Rubric (MESPR),” Michael S. Mott, William J. Sumrall, Debby A. Chessin, Angela S. Rutherford, and Virginia J. Moore describe a rubric designed to help students understand the scientific method and use multimedia to present scientific experiments. The assessment of the rubric found that it contains face validity ( $n=5$ ) for increasing science literacy and content validity for focusing teacher-student dialogue on science methodology.

These articles report on a wide variety of up-and-coming research in our fields. I hope you enjoy learning from these researchers as much as I have, and I encourage all readers to submit their research for future publications.

Regards,  
P.K. Raju