

Editorial

Dear Colleagues,

Welcome to Volume 12, Issues 5 & 6 of the Journal of STEM Education: Innovations and Research! This summer has been one of transition for our journal, as my editorial assistant, Ashley Clayson, has moved on to pursue her doctorate at the University of Minnesota. I thank her for her dedication to the Journal of STEM Education and wish her well in her future endeavors. I would also like to extend a welcome to my new editorial assistant, Kristen Billy.

I am pleased to begin this issue with a guest editorial by Phillip C. Wankat of Purdue University. "Cross-fertilization of STEM Education Communities" examines the rate of dissemination of engineering education innovations by analyzing the citations in several journals in the field, focusing specifically on the Journal of STEM Education: Innovations and Research. This editorial reveals the impact engineering education journals have on one another, and makes recommendations for how we can improve communication among the innovators in our field and increase dissemination of the important strides we are making. Several such important developments are exemplified in the seven articles presented in this issue, many of which focus on unique projects and approaches that will help integrate STEM subjects and promote positive attitudes toward STEM fields among high school and undergraduate students.

Our first article is "Uncovering Students' Preconceptions of Undergraduate Research Experiences," in which Omolola A. Adedokun and Wilella D. Burgess look at qualitative data revealing students' expectations and beliefs prior to beginning research internships. The authors' findings indicate a marked difference between these students' preconceptions and their actual experiences, and they consider how these findings can be used to improve the undergraduate research experience.

Next, Kurt Becker and Kyungsuk Park use meta-analysis to synthesize existing research on the integration of STEM subjects in "Effects of Integrative Approaches Among science, Technology, Engineering, and Mathematics (STEM) Subjects on Students' Learning: A Preliminary Meta-analysis." Examining such factors as grade level, types of integration, and students' achievement through integrative approaches, the authors conclude that integrative approaches do indeed positively impact STEM education.

In our third article, "Project WISE: Building STEM-Focused Youth-Programs that Serve the Community," Gregory DiLisi, Keith McMillin, and Margaret Virostek describe Project WISE, a venture that aims to foster young women's interest in the STEM fields. The authors discuss the benefits of this unique program, how it can be improved and reproduced by others, and the impact it can have on STEM education.

We learn the results of a second project designed to promote interest in STEM-related careers in "Surprising Possibilities Imagined and Realized through Information Technology: Encouraging High School Girls' Interests in Information Technology." In this article, Anna Forssen, Tonya Lauriski-Karriker, Alka Harriger, and Barbara Moskal report the positive change in attitudes toward IT that they observed among high school students (especially girls), teachers, and counselors after participation in this three-year project.

Muhammad Usman and Amit Singh, in "A New Undergraduate Curriculum in Mathematical Biology at the University of Dayton," present the interdisciplinary course they have developed integrating mathematics and biology. They detail the course and their students' very positive reactions to it, and they discuss the impact that such courses could have not only on students seeking careers in the increasingly mathematical field of biology, but also on student learning in all of the STEM subjects.

Our sixth article is a case study presented by Chetan S. Sankar, P.K. Raju, Ramachandraiah Alur, Rajan Venkateswaran, and Rajasekar Elangovan. "Solving the Acoustic Problem in Polyvalent Hall at Mauritius: Global Design Challenge Facing Larsen & Toubro, Limited" challenges students with the combined engineering and business concerns encountered by a company in Chennai, India. An acoustic problem in an important international music hall is described along with several alternative solutions, allowing students to consider the effectiveness, efficiency, and cost of each option.

Finally, "TeleEducation Initiatives for Sub-Saharan Africa: The Case of the African Virtual University in Kenya" by Lakisha L. Simmons, Irene Mbarika, Victor W. Mbarika, Carlos A. Thomas, Clive Tsuma, Tamiara L. Wade, and DerKirra Wilkerson, illustrates an education option for post-secondary education in Sub-Saharan Africa, where opportunities and resources for students at the college level are severely lacking. The authors describe the dire need in this region and the successful approach of the African Virtual University, which can serve as a model for other institutions in the future.

We always welcome any comments or suggestions from our readers, and I invite you all to send responses to me at jstemed@gmail.com. As we enter a new school year, I hope that these articles will inspire you all with their promising indications of the positive results our initiatives can have on our students. Have a good fall semester!

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