How SCME's Plug-and-Play MEMS Technology Programs Have Broadened STEM Curricula Worldwide

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Abstract

The Southwest Center for Microsystems Education (SCME), a National Science Foundation (NSF) funded Advanced Technological Education Center (ATE) (DUE #1205138), provides training, mentoring, support, and educational materials targeting 2-year, 4-year, and secondary STEM programs. Since its inception in 2004, SCME has created a vast Community of Practice with instructors from the targeted secondary STEM and undergraduate technology programs from 26 states and 12 countries. Over the past 12 years, SCME has developed over 40 learning modules and 11 hands-on kits used by instructors to teach MEMS in STEM classrooms. This suite of materials was designed and intended for instructors to plug and play into their STEM courses. To facilitate the incorporation of MEMS into STEM classrooms, SCME has provided training, support, and educational materials to this community via SCME online material libraries, SCME YouTube channel, webinars, hands-on workshops, multi-day cleanroom workshops at several sites, and professional development and training via distant learning platforms.

In this paper, the authors present the effects and the extent of SCME's plug and play MEMS technology programs. It discusses the broad community of users that has evolved from SCME's training and educational efforts. It shows how SCME's materials have affected their classrooms by providing case-studies on how members of SCME's user community have used and evolved SCME's MEMS educational materials for their classrooms. The members of SCME's active user community are mapped and correlated to local industries. The paper will also present how SCME has utilized many vehicles to educate, train, and support both STEM instructors and students. A correlation between student impact hours and education vehicles is made to show the effectiveness of the different methods.