

**The Michigan STEM Partnership In Action:
A Collaboration Between Business, Education, and Government**

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Abstract

The goals of the Michigan STEM Partnership focus on developing and executing a statewide plan of action to increase interest and achievement in STEM, and to engage business and industry in achieving those goals. The fifteen-county Lake Michigan Hub connects the rich and diverse STEM assets of the southwest Michigan region and provides a forum to share knowledge and resources by engaging the region's traditional and non-traditional education institutions, businesses and industries, workforce development organizations, professional organizations, and governmental agencies. In the midst of its second year of existence, the Hub has been involved with the leveraging of regional STEM assets, improving public engagement in STEM education, developing new STEM partnerships, and developing a sustainable structure for supporting the mission of the Michigan STEM partnership. Deliverables have included the building of regional asset and expert maps, hosting local Family Engineering nights, hosting reviews of the Next Generation Science Standards for K–12 educators, and engaging diverse stakeholders in the process of improving the region's STEM outlook.

Keywords: STEM, Conference Proceedings, Career Development, K–12 Outreach

Introduction and Background

Of the thirty fastest growing occupations projected through 2016, the U.S., Bureau of Labor Statistics' Occupational Outlook Handbook concludes that sixteen of them will require substantial mathematics and/or science preparation (STEM Education Coalition, 2010). According to the Georgetown University Center on Education and the Workforce, Michigan alone will need to fill 274,000 STEM-related jobs by the year 2018 (Carnevale, *et al.*, 2010). Therefore, it is in the vital interests of the region and the state to organize the stakeholders of STEM education around the principles of cooperation, collaboration and innovation to build a more prosperous future for Michigan.

The Michigan STEM Partnership (mistempartnership.com) is a statewide collaboration of leaders from PK–20 education, business and industry, philanthropy, economic development, government, military, and other organizations dedicated to elevating STEM literacy and proficiencies in a way that increases Michigan's economic strength to retain and attract desirable jobs. The Partnership was initiated by the Michigan Mathematics and Science Centers Network (MMSCN), who provided initial funding for the Partnership, and continues to facilitate the Partnership and support the Partnership's Executive Director and supporting staff. Among the five regional communities of which the statewide Partnership is comprised, the fifteen-county Lake Michigan Hub connects the rich and diverse STEM assets of the southwest Michigan region and provides a forum to share knowledge and resources. Its overarching goal is to engage the region's diverse constituencies to provide a gateway to high quality STEM education opportunities and related careers.

Results to Date

The foundation for success of the Michigan STEM Partnership, and the Lake Michigan Hub in particular, is the partnering of traditional and non-traditional K–20 educational organizations with supportive regional businesses, industries, workforce development organizations, professional organizations, and governmental agencies. The Lake Michigan Hub has attracted membership from across these organizations, including but not limited to the RESAs of Allegan and Kalamazoo, the ISDs from the Muskegon area, Kent, Ottawa, and Van Buren Counties, six regional Mathematics and Science Centers, The Kellogg Company, Alcoa, The Kalamazoo Chamber of Commerce, Western Michigan University’s College of Engineering and Applied Science, Grand Valley State University’s Padnos College of Engineering, Ferris State University, The Battle Creek Enquirer, and The Dudley STEM School. Partners meet on a quarterly basis. While the Hub spent much of its first year on important foundational activities, such as developing a Hub charter and leadership structure and analyzing regional needs, several projects were undertaken, as well:

- Asset and expertise maps — The partnership has compiled searchable databases for STEM-related assets (programs and activities) and STEM experts, available through <http://mistempartnership.com/assetmap.html> and [/expertmap.html](http://mistempartnership.com/expertmap.html).
- Family Engineering Nights — The program is designed to introduce 6–12 year olds and their parents to an appreciation and understanding of the roles engineers and engineering applications play in every-day life (Jackson, *et al.*, 2011). Children, accompanied by their parents, participate in a series of self-directed tabletop “opener” activities that provide learning through short, fun experiences with engineering. Openers include activities such as exploring efficient yet effective showerheads (made with plastic cups!), and designing aluminum foil “boats” for maximizing payload. The evening program concludes with longer, group-oriented, engineering challenges, such as simulating an assembly line or designing a pipe-cleaner structure with increased constraints. During the first year of the Partnership, approximately 2900 students and 2100 adults participated in 60 Family Engineering Nights (SAMPI, 2012), and events are continuing through the second year of the partnership.
- Next Generation Science Standards (NGSS) — The teaching of K–12 science in Michigan is shifting from content to practice via this nationally-developed framework. Facilitated by the MMSCN, Partnership members were invited to participate in workshops providing school personnel with information to help administrators, teachers and other staff better understand the intent, structure, use, timeline and implications of the NGSS. Attendees from more than 130 Michigan school districts benefitted from these workshops. Pre- and post-session assessments indicated that participants grew significantly in terms of understanding the intent, structure, and timeline of NGSS. Reviews of the second draft of NGSS continued this year, and the partnership is expected to play a role in the roll-out of NGSS later this year.
- Xsci Africa Experiential Education Research Collaborative — The Partnership Hubs facilitated the selection of a cohort of Michigan K–12 teachers to participate in this experiential education opportunity for the forthcoming summer.

Conclusions

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Even in its infancy, the Michigan STEM Partnership is making an impactful contribution toward developing STEM programs and STEM experts. As the Partnership moves from its foundational stages, it will focus further on the development of additional STEM programs and resources, and increase and strengthen partnerships between varied constituencies all interested in furthering the STEM agenda.

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