Great Lakes Bay Region Expands STEM Learning to Rural Areas with Help from Local Libraries

This is the first of three Michigan profiles spotlighting MASP’s regional partners in the Million Girls Moonshot project as they reimagine a future with more girls exploring STEM and engineering fields in out-of-school time programs. The stories address topics including best practices, equity and inclusion, family engagement and professional development.

Mount Pleasant, MI – In the Great Lakes Bay Regional Alliance (GLBR), the future is inclusive. Founded 16 years ago by business leaders and educators committed to building the workforce of tomorrow, the eight-county region isn’t about to leave anyone out of its mission to promote in-demand STEM experiences in afterschool programs, especially if it means breaking barriers that have stymied girls from discovering STEM and the engineering field.

Through its aptly titled STEM Access & Equity Initiative Mini Grant Opportunity, the Region has a track record of bringing STEM programming to schoolchildren, with special insights for reaching girls. In an initiative launched in 2018-2019 before the outbreak of the COVID-19 pandemic, the Region developed a winning formula for reaching out-of-county youths in underserved rural communities by offering rare STEM workshops at four branches of the Chippewa River District Library system in Isabella and Gratiot counties. It’s a formula that’s earned high praise from partners.

The outreach was made possible in a collaboration with the Center for Excellence in STEM Education at Central Michigan University (CMU), well-known for providing quality STEM education experiences for teacher education students, K-12 students and families and in-service teachers and schools at CMU. Rich VanTol, a Supervisor with the Bay-Arenac Intermediate School District, and a champion for the work of the Great Lakes Bay Regional Alliance, recognized the center at CMU for leading multiple efforts to facilitate STEM learning in out-of-school time, citing their work with Boys & Girls Clubs, schools, the Mount Pleasant Discovery Museum, in addition to the Chippewa River District Library System.

“The team at the CMU Center for Excellence in STEM Education have been helping to shape our STEM learning ecosystem in multiple ways,” VanTol said. “As key members of the Out-of-School Time STEM
Network, they act as pioneers to help incubate new ideas in STEM education, provide professional development for in-school and out-of-school time educators on implementing and sustaining best practices, and are a key resource for technical assistance. The Out-of-School Time STEM Network members look to them for leadership, expertise and innovation.”

Julie Cunningham is the director of the center, which early on decided that educators would need to think beyond the campus construct to engage families and students who aren’t typically found on campus. They landed on an outreach plan through local libraries, engaging staff eager for training in STEM experiences. Additionally, with more than 9,000 of the nearly 14,000 patrons of the Chippewa system children and youth, the potential impact over time showed promise. “We knew the library was interested in becoming more involved,” she said. “We saw this as a way to reach families who aren’t able to come to campus because they lack transportation or for other reasons, but they are able to visit library branches closer to home.”

With $4,000 in grant funds from the GLBR, Cunningham and Project Facilitator Amanda Cornwell brought librarians to CMU for a two-day training in the Fall of 2018. They immersed librarians in the same processes children would experience - a design thinking challenge, coding with Edison robots, Makey-Makeys and Raspberry Pis programs, and familiarity with other materials used in creating things. The educational supplies have remained at the local branch libraries where they will be put to use again when the need for social isolation necessary to blunt the spread of the highly contagious coronavirus is lifted and in-person activities return.

The students who attended covered a span of age grades from 3rd to 8th, and it was Cornwell’s goal to instill in them the “maker mentality” of perseverance, or as she put it, “Fail often to succeed sooner.” Building capacity within the library system was another intention. “We wanted to help the librarians feel comfortable leading these programs with our without our assistance,” Cornwell said.

During the grant period, 161 youth participated in the workshops including events with “Milo the Science Rover” that students constructed and coded out of the Lego WeDo 2.0 robotics kit. “Patrons had so much fun that another round of STEM programming called ‘Power of the Pen’ was scheduled. In this series, patrons constructed “scribblebots,” coded “Ozobots” by drawing with specific colored paths, explored black-out poetry, and constructed with 3D pens.” The collaboration continued with STEM events related to Summer Reading Program themes of Sound.

Participating families gave the STEM activities enthusiastic reviews. “We had families ask us where we would be next,” Cunningham added. “Some families traveled to multiple locations to experience the same program. It was well-received. And a lot of times parents were as engaged as the kids even though that wasn’t purposeful. It was really fun watching the wide range of kids get engaged.”

Cunningham said developing problem-solving skills, or figuring out ways to use a particular tool, was at the heart of their activities to positively engage youth and avoid frustration. “Family engagement is important. The more you can engage families the more familiar the word STEM becomes and less scary it is. It’s increasing our world view of what’s out there,” said Cunningham, whose own affinity to science grew from a love of nature and the outdoors. She taught high school for 15 years before coming to CMU.
The initiative was designed to engage both boys and girls, but their work was aided by special insights into how girls are attracted to STEM and engineering activities. “We’re intentional in the language we use – words girls can better relate to. Instead of say engineering, we use design which is female-friendly,” she said. “We stay away from language that intimidates girls who are really very good at problem-solving. We use a framework in which we do not ask for one right answer – creating winners or losers – because we want everyone to feel successful.”

Nuances matter. Cunningham said they discovered they were able to attract more girls to an e-gaming sports tournament when they included use of computers and iPads, rather than limiting the tools to joy sticks popular with boys. Attention to those details has meant they haven’t struggled filling coding programs or STEM afterschool programs designed just for girls.

The importance of storytelling emerged as special feature of the students’ work with robots, particularly with girls, said Cornwell, a former middle school language arts teacher. Giving “Milo” a backstory was part of engaging the children, for example, and after a while they were so engrossed in the building process they didn’t even realize “they were doing the engineering and coding,” she said.

After poring her heart and energy into the project, Cornwell said it was her hope that children grew from the experience unafraid of asking questions, and continue to work solving problems without immediate answers. One episode reinforced in her mind the value of STEM education. One day she was working with several small groups of schoolchildren when she spotted a young girl working hard to build a radio out of plastic Electronic Snap Circuits by Lego, with her partner, a boy, working alongside her. A competition was mixed into the event. Cornwell watched as the girl and her partner each built their own circuits, and then her attention was raised when the girl turned over her creation to the adult leader.

“Students gathered around as the leader held it up in the air to test the sound. Everyone around was listening to the radio she just built!” Cornwell said. “The look on little girl’s face was pure elation.”