

STEM West: Community Forum

WHO WE ARE

A Brief History--STEM West is a partnership of organizations working together to provide equal access to STEM opportunities in rural western NC. Together, we address STEM education challenges through private/public partnerships.

STEM West began as a partnership between a Catawba County teacher and The Science House of NC State University (NCSU). This partnership resulted in over a million dollars in grants. Participation in these grants led to further partnerships across the state, especially with STEM East (www.stemeast.org).

In November of 2013, the first STEM West meeting was held inviting a variety of community members: school administrators, government officials, business owners and operators, teachers, higher education, community colleges, science centers, non-profit organizations, and interested citizens. Dr. Sam Houston, CEO of the NC Science, Mathematics, & Technology Education Center (SMT Center) set forth the challenge to build STEM West into an organization that can have a positive influence on STEM education and ultimately the workforce and economic development of western NC. STEM West continued to solicit feedback and support from STEM stakeholders and funders which led to STEM WEST in 2016 becoming a part of the Western Piedmont Council of Governments (WPCOG) as the education arm for workforce development. As of January 2020, STEM West is recognized as a 501-3c organization and is housed at the NC Center of Engineering Technologies (NCCET) of Appalachian State University. The STEM West regional partnership includes seven counties in rural NC reaching from the northwest region down to the South Carolina Boarder. These systems are responsible for the education of approximately 100,000 students (60% Free/Reduced lunch).

Mission and Initiatives:

Mission Statement

STEM West advocates and supports the alignment of educational and occupational objectives through the regional workforce and community partnerships.

STEM West Initiatives

1. Secure and sustain STEM partnerships between education/industries/government/higher education
2. Develop and implement problem-based curricula/scenarios for K-16 science, math, and CTE courses based on local STEM career opportunities
3. Foster interest in and introduce students to STEM careers
4. Provide information to the community regarding STEM career pathways

Methods used for Initiatives:

STEM West has actively engaged partners for the purpose of offering aligned STEM efforts across the seven rural counties in western North Carolina by:

1. [Filling the Gap](#): Partnering with 25+ local STEM businesses, almost 100 educators have been trained in project based learning (PBL) and many have created and implemented [PBL](#) units in their classrooms, engaging 3000+ students in [real-world business problems/issues](#).
2. [Robox Sumo](#): Train-the-Trainer one-day workshop, funded with a Biogen grant, led to 54 adults being trained and over 400 students engaged in engineering robots through after-school clubs, science center events, and scout programs. This one day opportunity continues to impact more students across the region.
3. [GEMS \(Girls Engaged in Math and Science\) Clubs](#): 70 coaches have been trained and over 20 clubs continue to flourish after three years. Coaches received four days of training and \$200 for club supplies.
4. Fairs & Festivals: STEM West continues to be represented at the Historic Morganton Festival and the Taylorsville Apple Festival annually to share STEM

Career information with students and parents. In partnership with the NC Community Colleges BioNetwork many students and adults participate in hands-on, engaging activities such as making their own DNA necklaces. Over 500 community members are engaged in discussions of STEM careers each year.

5. [EdCamp STEM West](#): The first STEM related EdCamp was attended by 130+ people interested in STEM Education. EdCamp STEM West has become a regional event hosted every other spring.
6. Code.org: STEM West organized and hosted [Code.org](#) training for over 50 teachers across western NC. Regional elementary teachers also worked together to develop a [Matrix](#), integrating the Code.org curriculum into the K-5 standards across all subject areas. This document is being shared across the state through the NC Dept. of Public Instruction.
7. GIZMOs Grant: STEM West collaborated with Explore Learning to access an estimated \$120,000 in services for western NC school districts. These districts received a one-year access to [GIZMOS](#), an online simulation site, and three days of training on inquiry instruction. This resource is being used heavily across the region.
8. Computer Science Training: STEM West collaborated with NCSU's Friday Institute to host follow-up trainings for the middle school NC Computer Science Pilot at the NC Center of Engineering Technologies.
9. [EXTREME STEM Tour](#) Training: In partnership with Education Matters of Catawba Valley Community College, STEM Tours teams held two trainings with participants from 12 different counties. Over 50 community stakeholders learned how to implement their own tours. Additional districts have implemented the tours. These tours are now taking place in at least three districts and others have developed variations.
10. LEGO Equity Grant: Receiving a LEGO Equity grant three schools received WeDo kits, training, materials, and iPads to engage 144 girls in FIRST LEGO League, Jr. cumulating in the girls sharing their learning at a LEGO EXPO. With additional funding, six more clubs will be started in the fall in our local libraries and schools.

11. Asset Map Developed: Working to understand the STEM educational opportunities in the region, an [Asset Map](#) continues to be updated to evaluate gaps in access to quality STEM programming, as well as links to strong programs that may be replicated.
12. [STEM Trek!](#) a NC Science Festival Event: Annual event in April to connect families with local STEM businesses through engaging hands-on activities. This event is in partnership with the [Catawba Science Center](#) and Klingspor, Inc.
13. [Kramden Institute: Provided 750 refurbished desktop computers](#) loaded with 100+ educational software programs to students in the region with no computer access at home.
14. Sustainability Steps: A STEM West Business Plan and Communication Plan has been written and approved by Advisory Board. Presently, seven school districts are formal partners with STEM West. Business partnerships are being developed.
15. District Science Strategic Plans Developed: Supported by the SMT Center, three of the seven school districts have attended [LASER](#) training to develop five-year science education strategic plans. These were guided by the faculty of the Smithsonian Education using researched-based strategies and curriculum. Other districts are planning to attend in the future. The goal is for every STEM West partnering district to be able to collaborate in moving forward with science inquiry instruction.
16. Impact: In less than four years, STEM West has impacted almost 7000 students and over 550 educators through teacher training, student events, clubs, etc. Students have participated in STEM units, clubs, and events focused on STEM careers and/or skills.

Project Outcome

The project goal was to improve rural STEM education through stronger networks and informed stakeholders. This would be achieved through:

- Increasing regional networking around STEM education

- Increasing support for working regionally through STEM West to support STEM education efforts across service area
- Determining the three focus areas for the region to improve/expand STEM educational opportunities equitably across the service area

The outcomes of the focus groups/events were developed to benefit the entire service area by informing all stakeholders in attendance about the variety and impact of STEM educational opportunities that already exist in the region but may not provide access to all residents. The challenges to equal access were discussed and ways to meet these challenges were the focus of the agenda.

The information shared and decisions consequently made during the focus group is being shared with the entire STEMx membership as well as the SMT Center sharing through its extensive network across NC. The processes and projects may benefit other rural communities in the STEMx community.

Preparations:

The initially proposed location of Foothills Higher Education Center in Morganton, NC was not sufficient for the number of registrants. The location was changed to the Isothermal Community College: Performing Arts Center, that provided additional breakout rooms. The room above the event area also provided an effective venue for the Expo of current best practices.

Each of the seven school districts was contacted to begin recruiting three STEM programs to highlight at the Forum. The grant provided substitute pay for three teachers but each system could bring more if additional funding was not required. A Google Doc was set up that each system could access to make sure they were not replicating programs and to assure participants did not see for instance, four tables of the same robotics club. The types of programs that were presented at the EXPO consisted of: Project-Based Learning units with business partners, School-wide STEM projects, after-school STEM clubs, Project Lead the Way (PLTW), Girls Excelling in Math and Science (GEMS) clubs, district science centers, science museums, Career Technical Education (CTE) programs, middle school health education programs, robotics competitions,

school-wide elementary STEM program, drones in the classroom, grant programs, Career Awareness and Readiness Program (CARP), camp opportunities, coding, STEM in public libraries, equipment loan programs, etc. The lead facilitator, Dr. Tom Williams and Lisa Rhoades of the SMT Center met regularly with Dr. Carol Moore of STEM West to plan the program details, menus, venues, and speakers.

THE DAY OF THE STEMx Community Forum

Segment	Agenda Item	Time	Resource Links
	Registration and Check-in	8:30 – 9:00	PPT link
	Exhibits upstairs	9:00 – 10	
	Networking Coffee/Muffins Welcome and Introductions	10-10:15 10:15	
	Unconferenced EdCamps	10:50	EdCamp Session Board
	Lunch Program and Table Sharing	12 noon	
	Work Session 1 and Work Session 2	12:45 or 1	
	Break	2:15	
	Work Session 1 and Work Session 2 (continued)		THEMES by consensus #1 #2 #3 #4

Evaluation Form	2:30	Evaluation Link
Closing Session Highlights STEMWest Charge	2:45 - 3:00	

The venue hosted 27 exhibitors, 3 from all of the 7 school districts, and others from museums, community colleges, and state-wide programs. During networking time, attendees received a matrix with the exhibitors contact information, program, and a space to take notes for each program.

Following a breakfast break, introductions were made and STEM West programming was shared. The registrants had already participated in a pre-event survey to identify the areas of greatest interest for the EdCamp sessions:

	Room A Tanner	Room B Cooley	Front Room	Back/Glass Side Room
Session 1 11:00-11:25	1A Increasing Student Engagement in/out of School	1B Best Practices in Professional Development/Learning	1C Building Business and Community Partnerships	1D Computer Science/Coding
Session 2 11:30-11:55	2A STEM Careers and Workforce Development	2B Innovative Teaching/Learning Tools (Makers, Robotics, etc.)	2C STEM Equity and Equal Access for ALL Students	2D Funding and Resource Acquisition

Participants selected which section most interested them and facilitators initiated

discussions in each room while a volunteer completed the Google Form with notes. Most participants added their contact information onto the Google Form as well for additional networking following the event.

Lunch offered an opportunity to hear from the NC Teacher of the Year (TOY) Mariah Morris (@Morristeach1), speak about her platform on equity and access. The message was well received and aligns with the STEM West vision of providing access to ALL in our western rural community. Twitter was very active during the speaker's address and for many days following!

The afternoon session was led by Dr. Tom Williams, a well-known NC advocate of public education. He guided the participants through the Affinity Process to provide a voice to all areas of the region as well as the varied affiliations represented. He started with Sticky Notes at the tables to answer the question: What ideas, activities, and/or programs can accelerate STEM West to advance the building of new or future partnerships to improve our regional economy? (Slide 29). Once they had an opportunity to individually brainstorm, several tables were merged to share their brainstorming ideas and organize these into common categories and then add them to a chart with headings. Each of the larger groups shared out and a master list was created to eliminate repetitions and merge similar ideas. At break-time, the attendees used their five consensogram dots (provided at check in) to denote the most important work STEM West should undertake. Each participant was allowed to use a maximum of two dots on any one idea to assure a larger consensus was reached on the group's priorities. Once the findings were shared and the charge to continue networking for improving STEM education in the region, four breakout sessions were developed to discuss issues: 1) Expand business partnerships and engagement with STEM Education, 2) Equity for student STEM education, teacher PD, representation in workforce/education, 3) Additional resource/center for PD re: STEM careers/education—virtual/materials, and 4) Work collaboratively/marketing to increase engagement with STEM West. All received access to a Google document to record discussion notes and volunteer for additional work on the topic. At the end of the session all attendees received via email a session evaluation and the slide deck from the day.

MAIN TAKEAWAYS FROM THE CONVENING

The convening was well attended from across the state of North Carolina, with the majority of the 130 attendees from the seven rural counties of the STEM West service area. They represented all seven school systems, multiple universities, community colleges, non-profits, businesses, and foundations. Students, teachers, administrators, college presidents, CEOs, professors, and legislators collaborated throughout the day.

Highlights of the day include:

- Twitter of Mariah Morris (TOY) with focus on equity well received
- Results of affinity process—STEM West initiatives/goals received affirmation (validated what STEM West direction is and already doing in the region)
- Desire for annual meetings similar to this one, streamlining the affinity process and making EdCamp groups much smaller or deleting them and making more of a workshop series/concurrent sessions
- Appreciated Expo to learn from each other across the region—wanted more time
- Network strengthened—
 - Partnerships born with construction industrial partner (who also works with current business partner in aggregates)
 - additional university outreach program—multiple meetings have occurred—new projects are on the horizon!
 - Grant writing partners were established with local science museums

Next Steps for STEM West:

Although all four of the final breakout focus groups shared notes of their discussions, only one provided a list of participants who provided a willingness to work as a subcommittee. This committee was discussing how STEM West can better establish itself as the STEM PD/opportunity hub for the region. As a result, on April 27, 2020, the committee met virtually (because of COVID-19). The committee included classroom teachers, university outreach director, and the STEM West president. After much

discussion about what is possible with a STEM West staff of one, it was decided that the STEM West website will host a PD update each week. It will highlight PD opportunities in the region. After the first two posts went out, the committee was surveyed for feedback. It was shared that the post needed to tag or denote each opportunity by grade/subject for more efficient use by educators and community members.

In closing, the STEM West “Best Practices Today and Tomorrow” achieved its intended outcomes for the day and clearly validated that while our current activities are advancing STEM education and workforce development in seven counties, much remains to be done to realize the mission and vision for STEM West in the months and years ahead. STEM West will continue to openly communicate with stakeholders throughout the region to read the pulse of the workforce needs and how the educational system can better align its efforts to do so.