PROMISING PRACTICE GUIDELINES FOR ENGAGING GIRLS IN STEM THROUGH OUT-OF-SCHOOL TIME

New Mexico Out of School Time Network
The New Mexico Out-of-School Time STEM Gender Equity Coalition
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INTRODUCTION

According to the U.S. White House National Science and Technology Council, the innovation capacity of the United States—and its prosperity and security—depends on an effective and inclusive STEM education ecosystem. Women are significantly underrepresented in STEM (science, technology, engineering, and math) education and employment. Although women make up half the population, they comprise less than 30% of the STEM workforce.

The U.S. Department of Commerce estimates that jobs in STEM will grow 17%—that's 55% faster than non-STEM jobs over the next decade (National PTA). While STEM job growth is exciting, economic projections also predict as many as 2.4 million unfilled STEM jobs due to a lack of qualified workers in the pipeline (National PTA).

In order to attract the best and brightest minds into the fields and move our nation forward in STEM, it is vital that we engage more women in STEM (Futurity). Research from Futurity's network of leading universities shows that the key factors impeding women entering STEM include lack of pre-college experience, gaps in confidence and perception about abilities, and a masculine culture that discourages women from participation.

Many of the innovations and solutions to the problems we face in our world will not be created by today's adults, but by the young people in our out-of-school time (OST) programs and classrooms (Discovery Education). OST programs offer one of the most significant opportunities for getting girls excited and engaged in STEM. OST programs take place outside school hours (before school, afterschool, summers, weekends) in a variety of settings, including schools, community organizations, cultural institutions, universities and more. Children and youth spend only 20% of their waking hours in school. Participating in STEM OST programs can add more than 1000 hours of learning, enrichment, and skill development for girls each year.

THE NEW MEXICO OUT-OF-SCHOOL TIME STEM GENDER EQUITY COALITION

By working together across education, business, community, family and other sectors, we can engage more girls in STEM paths that will shape their lives, futures, and our world. To this end,

the New Mexico Out-of-School Time Network (NMOST), with funding from the STEM Next Million Girls Moonshot initiative, launched the New Mexico STEM Gender Equity Coalition in July 2020. The Coalition's purpose is to recruit, inspire, and engage more K-12 girls in STEM through New Mexico's OST programs. The Coalition commenced by developing Promising Practice Guidelines for OST programs, along with a two-year action plan. Currently comprised of 15 leaders from New Mexico organizations focused on STEM and girls, the Coalition will continue to grow and add new voices over time. Coalition members represent education, research, cultural, and youth-serving organizations, including:

1. Erika Acosta – NMSU's Mathematically Connected Communities (MC2)
2. Wiebke Boeing – NMSU's Girls on Outdoor Adventures for Leadership and Science (GALS)
3. Allison Brody – Explora
4. Cheri Burch – American Association of University Women
5. Becky Calhoun, Girls Inc.
6. Selena Connealy – New Mexico Established Program to Stimulate Competitive Research
7. Caitlin Everhart – New Mexico Out of School Time Network
8. Mahalia Hunt – New Mexico Out of School Time Network
9. Tim Karpoff – Co-Facilitator
10. Hollie Lovely – NM PBS/SciGirls
11. Jeff McConaughy – New Mexico Out of School Time Network
12. Sara Morales – New Mexico State University (NMSU) STEM Outreach Center
13. May Sagbakken – New Mexico Out of School Time Network
14. Kim Scheerer, New Mexico MESA
15. Brittany Sonntag – New Mexico State University 4-H
16. Michelle Sterling-Rodriguez – NMSU's Mathematically Connected Communities (MC2)
17. Debbie Zipes – Co-Facilitator

PROMISING PRACTICE GUIDELINES FOR ENGAGING GIRLS IN STEM THROUGH OUT-OF-SCHOOL TIME

The Coalition developed Promising Practice Guidelines for OST programs to recruit, engage and inspire more girls in STEM. The Guidelines are designed for leaders, practitioners, families, community partners, and volunteers working with girls in OST programs across New Mexico and nationally. Coming together to create a shared framework opens the doors for new ways to work together, develop training, and build new supports for the OST field to accelerate STEM change in our communities.

The Guidelines were developed from an extensive review of national research and literature, along with expert input and counsel from Coalition members. Focus groups with female high school and college

students were conducted at Explora and New Mexico State University to ensure the Guidelines reflect the realities of girls and young women, and the unique landscape and voices of New Mexico. Twelve promising practices emerged consistently across all of the research and conversations and serve as the core framework.

12 Promising Practice Guidelines

1. Celebrate Diversity

2. Create Safe Spaces and Sense of Belonging

3. Start Early and Keep it Going

4. Invite Girls to Change the World through STEM

5. Elevate the Voices of Girls

6. Create Opportunities for Mastery

7. Involve Families

8. Engage Female Role Models

9. Connect with Community Partners

10. Explore STEM Careers

11. Provide Training and Resources for Afterschool Staff

12. Assess Results and Measure Impact

1.   Celebrate Diversity

Design programs to be girl-centric and culturally responsive.[iii] Don't assume that all girls are alike.[25] How girls encounter the world is influenced not only by gender, but their unique demographic, geographic, and psychological make up.[25] Incorporate girls' unique interests, identities, cultures, and abilities into the STEM learning experience. Ensure that all girls have the opportunity to participate, regardless of zip code, income, or background.

Sources: American Association of University Women, Getting Smart, Sci Girls, STEM Next, Techbridge

2. Create Safe Spaces and Sense of Belonging

Create safe places where girls feel they belong and fit in. Safe spaces for girls include physical safety as well as emotional and social safety. Design your program space with culturally diverse and girl-friendly images and materials that counter stereotypes of who does STEM.[21] Give girls opportunities to share their opinions, collaborate on projects, and build trusting relationships.

Sources: American Association of University Women, Frontiers in Psychology, Futurity, Sci Girls, Techbridge, The Women's Foundation of Colorado STEM Guide, Venture Labs

3. Start Early and Keep it Going

Spark girls' interest in STEM early. Girls are born as young scientists with a natural curiosity about the world. Yet many girls start to lose confidence and interest in STEM as early as third grade.[3] By high school, gaps in interest are significant, with many girls no longer considering STEM pathways.[25] Continue to inspire and engage girls in STEM at all ages as they make decisions about who they are and whether they are good at and like STEM.

Sources: American Association of University Women, Education and Career News, Edutopia, Getting Smart, Girl Scouts, National Science Foundation, Sci Girls, The Women's Foundation of Colorado STEM Guide, Techbridge

4. Invite Girls to Change the World through STEM

Girls have a strong desire to change the world. They are more attracted to STEM when they can use it to help others and their communities. Design hands-on STEM learning that is relevant to girls' everyday culture and experiences. Empower girls to use STEM to solve real problems in their communities.

Sources: Forbes, Getting Smart, Girl Scouts, Sci Girls, Techbridge

5. Elevate the Voices of Girls

Invite girls to design, plan and implement STEM education activities. Empower girls to share their opinions and make choices about their STEM learning. Provide opportunities for girls to step up as leaders and mentors. Design events, such as family STEM nights, that put girls in charge and in the spotlight.[28] Create a learning environment where girls and boys are invited and encouraged equally to express their ideas. Equip girls with strategies to communicate effectively and confidently, especially in traditionally male-dominated educational and work environments.

Sources: Sci Girls, Techbridge, The Women's Foundation of Colorado STEM Guide

6. Create Opportunities for Mastery

Encourage girls to get out of their comfort zone, try ideas, and explore how things work. Introduce girls to new tools, technology and ideas.   Teach girls to embrace failure as a natural part of learning. Empower girls to master new skills, develop grit, and build confidence.

Sources: Click2Science, Sci Girls, The Girls Rise, The Women's Foundation of Colorado STEM Guide, Venture Labs

7. Involve Families

Create welcoming spaces for families to explore STEM with their daughters. Invite families to share their input in program design. Recognize the diverse perspectives of families in outreach and communication. Educate parents about STEM opportunities and career pathways that boost their daughters' talent and potential. Acknowledge the discomfort and uncertainty parents may feel about STEM. Let parents know that they don't need to be the experts or have the answers; it's their encouragement that matters most.[22]

Sources: Edutopia, Getting Smart, Girl Scouts, STEM Ecosystems, National PTA STEM Plus Families, The Women's Foundation of Colorado STEM Guide, Techbridge

8. Engage Female Role Models and Mentors

"You can't be what you can't see."[31] Create opportunities for girls to interact with female STEM role models with whom they can identify. Ask role models to share personal stories and how their careers make the world a better place. Invite role models to help girls see beyond stereotypes, create a positive STEM identity, and imagine themselves as future scientists and experts in STEM careers.

Sources: Afterschool Matters, Getting Smart, International Technology and Engineering Educators Association, National Science Foundation, Sci Girls, Techbridge

9. Connect with Community Partners

Foster opportunities for girls to learn from community partners and to experience STEM in different settings. Invite diverse community partners to OST programs to interact with girls. Bring together partners in education, business, cultural institutions, youth development, government and others to collaborate, coordinate, and grow STEM learning and career pathway options for girls.

Sources: Edutopia, STEM Ecosystems, Girl Scouts, National Science Foundation, Sci Girls, Women's Foundation of Colorado Guide, Techbridge

10. Explore Career Pathways

Introduce girls to a wide variety of STEM career and education pathways. Open doors for girls to identify their interests and explore how they connect with STEM careers. Engage New Mexico STEM industry partners to help girls see how STEM solves real-world challenges.

Sources: Sci Girls, Techbridge, The Women's Foundation of Colorado

11. Provide Training and Resources for Afterschool Professionals

Equip OST staff with training, curricula, and materials that boost their ability and confidence to inspire girls with STEM. Introduce staff to quality, real-world, girl-friendly STEM curricula. Educate staff about the inquiry process and strategies for creating a learning culture that empowers both girls and boys. Encourage staff to use indoor and outdoor spaces creatively to foster girls' curiosity and exploration. Engage outside STEM experts as trainers for staff and to facilitate hands-on learning with girls.

Sources: Afterschool Matters, Click2Science, Informal Science, Indiana Afterschool Network, Venture Labs, Women's Foundation of Colorado

12. Assess Results and Measure Impact

Ask questions and collect feedback from girls, families, staff, community partners and others. Measure changes in STEM skills, knowledge, and attitudes and among girls and families. Measure impact on staff development and community partnerships. Use results to inform program design and ongoing quality improvement. Share and publish results.

Sources: Afterschool Alliance, Expanding STEM Learning, STEM Next, The Pear Institute

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