

Equity in STEM | Southern STEM Network

In Fall 2019, STEM stakeholders from across Nevada came together for the STEM Summit, hosted by the Nevada STEM Networks. During the STEM Summit, STEM program designers, facilitators, educators, industry leaders, and government representatives discussed and identified needs for the State of Nevada's STEM ecosystem. As described in each region's Strategic Direction, three major themes arose from the Summit:



- Equity in STEM
- Awareness of STEM opportunities
- Access to high quality STEM education

The committees in each region (the Northwestern, Rural, and Southern) have been compiling best practices regarding increasing equity in STEM, as well as examples of local programs that have been working to address inequities in STEM. Below you'll find strategies, examples, tools, and research regarding equity in STEM.

This document is meant to be a launch point for program designers and providers with an interest in addressing inequities in STEM in Nevada. The Southern STEM Network Committee fully acknowledges the complexity of this topic as well as the group's limitations. This document is not meant to fulfill the region's goals toward eliminating inequities in STEM, but rather is intended as a conversation starter. We hope to use this document with stakeholders in the region as we collaboratively work toward eliminating inequities in STEM.

For more information, please visit https://osit.nv.gov/STEM/Regional_STEM_Networks/.

What Do We Mean by Equity in STEM?

Nevadans from populations traditionally underrepresented in STEM face many barriers to accessing on-going, high-quality STEM experiences that help build STEM identities and encourage participation and retention in STEM. Such barriers are often tied to longstanding systems of oppression. Day-to-day these barriers can appear as lack of transportation, childcare or mentors, negative micromessaging, and cost of STEM experiences, among numerous other barriers.

Groups traditionally underrepresented in STEM include women, black, indigenous, and people of color, those with disabilities, and those with low socio-economic status.

When we aim for equity in STEM, we aim to implement specific strategies for engaging and retaining Nevadans from underrepresented populations in STEM. Strategies can include initiatives such as training educators about unintentional micromessaging we can send to students, connecting philanthropies with high-quality STEM programming to increase access, or immersing into the community to learn, hear, and address the community's needs. STEM providers can increase equity in STEM by helping participants develop their STEM identities. This can be accomplished when programming is sensitive to participants' interests, values, and cultural identities and allows students to "own" the experience. More information about these strategies can be found below.

Equity in Action: Learning from your audience

Rosana Romero-Correa recalls an experience that changed her understanding of equity and unknowingly transformed how Girl Scouts of Southern Nevada approached STEM in their community. Below, Rosana tells the story of the events that shifted their view of equity.

Adelia* is now 9, but she joined our troop at age 7, during 1st grade when her father who is in the Military was stationed in Las Vegas. The first few Girl Scout meetings are always an introduction; they get the children familiar with us, build connections and the girls learn the process of earning badges and medals. After a few weeks, we were introducing the Astronomy badge. I motioned to a telescope and mentioned that at the next meeting, we would learn to use it and explore the science behind satellites.

Adelia looked at her mother, Nadia* and in the middle of the meeting said “I’m scared, I don’t know what’s going to happen if I look through that”. Her mother responded supportively, “I’ve never done it, we will learn together”. I approached Adelia and let her know that it was ok. I said, “it is safe, we will not be using it today; it is something we will learn about at the next meeting.”

She did not come to the next meeting.

I called and spoke with Nadia; I wanted to be sure that Adelia would be able to participate and earn her astronomy badge. Nadia explained that they were not there because she could not explain to her daughter how the telescope worked and therefore, Adelia would not go to the meeting.

I did not want Adelia to lose the opportunity to learn astronomy or earn her badge, so I reached out to an astronomer who speaks Spanish. Adelia had two barriers to participating, she was hearing-impaired so she had technology in her ear to help her hear. Her mom needed to hear the explanation in her native language so she could understand and explain the technology to her daughter in a way she would understand.

The astronomer called Nadia and explained how a telescope works and answered all Adelia’s questions. He sent them some pictures and explained exactly what they were going to learn. It was more than just translating information from English to Spanish, it was explaining it in the language and terminology both could understand, and this generated Adelia’s excitement.

She came back the next week!

The astronomer helped Adelia catch up on what she missed the previous week and she LOVED it.

**pseudonym
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What is Equity

This vignette describes the crux of the difference between *equality* vs *equity* in STEM opportunities.

If organizations conduct systematic examinations of their programs to identify how student interest, family values, community resources & cultural identity impact access and participation in STEM programs, they may determine that in an effort to provide the same resources and opportunities to everyone - equality, they are *missing* the element of access.

Equity is knowing the needs of the individual members of your community so the exact resources and opportunities necessary can be allocated to develop STEM identities in *all* students.

In other words, if equality is giving everyone the same resources, equity is providing *access* to those resources.

[Race Equity Impact Assessment Tool, Center for the Study of Social Policy](#)

Access

If we are committed to preparing our communities for a changing world, we must acknowledge that the unequal playing field exists and take action steps to counteract the barriers.

Redesigning STEM to fit the audience

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Adelia was one of the first girls to see things moving in the sky and ask the questions that drove future meetings.

The curiosity of the girls led us to move away from what *we* wanted to teach them; instead, we redesigned the program to answer the questions that they generated.

Adelia loved it so much, it was all that she wanted to do. Because she was hearing impaired; communication was very difficult for her. So we worked with her mother. We helped Nadia learn what she needed to know to teach her daughter. We helped Nadia get the materials and supplies Adelia needed to continue her explorations at home.

Until that moment, Nadia did not know how to inspire her daughter or help her learn but suddenly she was obsessed and wanted to learn everything. Adelia had made a connection with a STEM mentor she could relate to, the astronomer helped her to explore her curiosity about the stars and learn everything Adelia wanted to know about space. Adelia became our expert.

Why STEM is Critical to Southern Nevada

“Career and Technical Education (CTE) and Science, Technology, Engineering, and Mathematics (STEM) education are critical pathways for America’s youth and adults, offering access to high-skill, high-wage, in-demand programs of study and pathways to careers with financial stability. These occupations are still too often segregated by gender, race and ethnicity, socioeconomic status, and disability status. Women and girls; Black, Indigenous, and People of Color (BIPOC); individuals from low-income backgrounds; and individuals with disabilities are being left out of the opportunities and the promise of CTE and STEM.” ([NAPE, 2021, p. 1](#))

As of 2019, only 35% of the STEM workforce in Nevada are women, while the population of women in Nevada fluctuates around 50%. Similarly, 41% of the workforce identify as a race other than white, but make up 49% of the State’s population. (Brookings, 2019 and [Data Commons, 2019](#))

To build pathways for Nevadans, we must provide high-quality STEM experiences that purposefully engage and retain Nevadans from underrepresented populations.

Strategies for Addressing Inequities in STEM

Diversity as a Resource, Find Hidden Assets

- Project Development: Bring a diverse set of people to the discussion and planning.
- Leadership: The board governing the direction of the organization and community members contributing to the vision should reflect the diversity of the participants.
- Include families: Families can teach the organization about the community’s unique layers and help identify unforeseen barriers to access.

[Race Equity and Inclusion Action Guide, The Annie E. Casey Foundation](#)

[Families in the Driver's Seat, University Of Washington](#)

Shifting Mindset

Expecting a great deal from youth, convincing them of their ability, and helping them reach their potential are key steps in shifting the mindset from deficit to high expectations.

- Diverse mentorship with representation from the students’ communities can help students to see themselves in STEM.
- Programs that combine student-driven STEM experimentation with learning that provides leadership and growth mindset opportunities can encourage the development of STEM identity.

[How Girl Scout STEM Programs Benefit Girls](#)

[Ensuring That All Students Can See Themselves in STEM, Edutopia](#)

Cultivating a STEM identity

An interest in STEM does not necessarily translate into selecting a STEM career or having a STEM identity.

- Youth need opportunities to find personal and/or cultural value in STEM careers, this is critical to developing a STEM identity.
- The use of technology or field trips can take students onto a job site. Allow them to see a diverse workforce and learn about lesser-known careers and opportunities.
- STEM programs that are accessible to diverse populations lead to college and career transitions in STEM.
- Incorporating STEAM can allow Art to transcend a variety of careers and diverse groups.

[STEM Jobs See Uneven Progress in Increasing Gender, Racial and Ethnic Diversity, Pew Research Center](#)

[How to foster the formation of STEM identity: studying diversity in an authentic learning environment, International Journal of STEM Education](#)

[Equity in STEM: How We Take Action, CSTEM](#)

[Career and Technical Education in High School: Does it Improve Student Outcomes? Thomas B. Fordham Institute](#)

[STEAM and the Role of Arts in STEM, SEADAE](#)

Participant Engagement

Diverse and far-reaching community engagement increases the ability to connect with participants, access hidden resources, and move STEM education further.

It is essential that STEM programming:

- Is relevant
 - to participants and their interests
 - highlights connections to other aspects of their lives and schooling
- Prioritize sense of belonging
- Is appropriately challenging and accessible to the diverse population targeted for participation
- Practices applied to learning, students use critical thinking, collaboration, and real-world problem-solving skills.
- Is linked to local industries, STEM professionals, mentors, and embraces the community's values.
- Students have an opportunity to use the tools, skills, and technology that will lead to a future STEM college or career path.

[Sample Resources, OpenSciEd](#)

[Applied Learning and STEM Education, MassSTEMHub](#)

[Encouraging Students to Embrace STEM Programs, Hanover Research](#)

Reflection and Evaluation

Conducting a systematic examination of programs allows organizations to:

- Identify and utilize current best practices in engaging diverse learners.
- Employ the use of high-impact educational strategies.
- Deliver professional learning on equity and inclusion.
- Review and improve how information is being shared and communicated to communities.
- Refine efforts to showcase STEM resources in the community to involve and support families.
- Apply feedback from participants - caregivers need the resources to support the participants

[Educational Equity, STEM Equity Initiative](#)

[Do It Yourself Guide to STEM Community Engagement, NC STEM](#)

Professional Development

Ongoing professional learning about addressing inequities in STEM is crucial for any STEM provider.

- STEM Teaching Tools has equity in science [PD modules](#) that can be used with educators.
 - The modules can support professional learning to:
 - Build a base-level awareness of equity within the organization
 - Increase confidence in the ability to provide programming that is equitable
- NAEquity has developed [Root Causes and Strategies](#) which describe research around inequities and what can be done to address them.
 - As an organization, engage in an honest assessment of educational practices that are the root causes of inequity and exclusion to bridge gaps to build equity.
 - Use the strategies provided to shift organizational practices and curriculum toward inclusion
- Train your team to be cognizant of micro-messaging and ban language that is gendered or is unintended discriminating language
 - Commit to gender-neutral and inclusionary language and use strategies to hold everyone accountable.
 - Foster an environment where your team is encouraged to raise concerns about policies, curriculum, and programs that are discriminating.

Funding

One-time funding opportunities, such as broadband infrastructure projects, can have a big impact on barriers to STEM.

- Stay updated on State and Federal funding initiatives that can support one-time funding projects
- And network with community philanthropists to address inequities in STEM.

Visit [OSIT.nv.gov](https://osit.nv.gov) to see OSIT's grant opportunities and learn more about Nevada's Broadband initiatives.

Program Evaluation

Programs should regularly re-evaluate equity strategies.

- The [NAEquity IM STEM Rubric](#) or the Nevada specific [STEMList](#) describe the attributes of high-quality STEM programming and can be used for self-evaluation.

[Equity by Design: 5 Principles, USC Center for Urban Education](#)

Click [here](#) to review the reference material used in the creation of this document.