

Maximizing Your Classroom STEM Investments

Plan for Impact

We've all heard about the growing demand for qualified candidates in STEM fields and the opportunity this poses for students. But not all STEM programs are created equal. How can you ensure your STEM programs and classroom grants are impactful and lead students to grow in their interest and success in these areas? Consider the checklists below to help you "at a glance" vet proposed teacher/classroom STEM projects or influence how you think about other current or new STEM programming. (Source: Consortium paper, "Sparking and Sustaining Student Interest in STEM: Impactful Strategies for Local Education Foundations")

Elements of Impactful STEM Programs

Does your program focus on at least one of these elements?

☐ **Early Exposure to STEM**

Young children see STEM everywhere, especially through exploration and discovery. Does your project/program engage PreK and early elementary students in STEM through hands-on, play-based experiences?

☐ **Early Exposure to Engineering**

Solving real-world problems appeals to students. When students care about the outcome, they work harder and interest in STEM soars. Does your project/program have elements of the engineering design process—asking questions, imagining solutions, testing, improving and redesigning—imbedded in the content?

☐ **Excellent STEM Instruction**

Teaching STEM concepts is not for the faint of heart; it takes deep content knowledge and expertise to engage students and personalize learning. Do your teachers/school leaders bring the following to the table OR can your program support professional development in these areas?

- ☐ Training in teaching standards-aligned STEM concepts (e.g., FLDOE summer STEMposium);
- ☐ Algebra readiness for ALL students. Expertise in teaching algebra or other mathematics courses;
- ☐ Expertise and experience in project-based learning;
- ☐ CTE teaching credential they can combine with applicable STEM learning and/or development of CTE programs that lead to increased interest in STEM occupations, especially for locally identified in-demand STEM occupations.

☐ **Engagement in Informal STEM Learning Opportunities**

Informal learning opportunities let students discover STEM on their own terms—maybe at a slower pace or with the opportunity to try something new, something that doesn't fit in the school day—like robotics, coding, a makerspace or even gardening. Out-of-school opportunities are also great ways for adults who work in STEM fields to connect with students in a more informal role. Does your program take place outside of school hours and provide informal STEM exploration?

☐ **Community Partnerships**

Engaging local STEM employers in your project can generate excitement for STEM careers and provide clear pathways to higher learning in STEM. Does your project engage local STEM industry partners, especially in high-demand sectors?

☐ **STEM Mentors**

Without appropriate role models, students—especially those underrepresented in STEM fields—have difficulty imagining themselves working in that field. Does your project utilize appropriate mentors to help students understand the opportunities available to them?

☐ **Family Communication**

Helping families understand the promise and life-changing potential for STEM education is critical to expanding access and awareness. Does your project include and engage families in understanding the importance of STEM?

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Evaluate Your Programs

Want a quick evaluation of existing programs to know what indicators of impactful STEM programming that might be missing or need to be improved? Use the checklist below as a conversation guide with project facilitators to open the discussion on improving the impact of your program. (Source: The PEAR Institute's Dimensions of Success observation tool)

A Deeper Assessment of a Quality STEM Program

How do you rate these indicators of quality STEM programming from 1-5?

Features of the Learning Environment

- ☐ **Organization**—The facilitator delivers content in organized manner (all materials are at hand, time is managed well, unexpected changes are handled smoothly).
- ☐ **Materials**—The materials selected are appropriate and appealing (support STEM learning goals, culturally and age appropriate).
- ☐ **Space Utilization**—The space is utilized in manner conducive to STEM learning (allows for exploration and learning, no distractions).

Activity Engagement

- ☐ **Participation**—All youth are actively participating in all aspects of the activities during the time observed (all youth are involved equally).
- ☐ **Purposeful Activities**—Activities are related to STEM goals and opportunities (facilitator guides youth towards STEM learning goals).
- ☐ **Engagement with STEM**—Youth are engaged with hands-on activities where they can explore STEM content (youth do cognitive work themselves).

STEM Knowledge and Practices

- ☐ **STEM Content Learning**—Activities support youth developing meaningful STEM content learning (accurate and complete activities, connections across content ideas, youth comments and questions support their understanding of content).
- ☐ **Inquiry**—Youth are engaging in STEM practices during the activities (youth authentically pursue scientific questioning, tackle engineering design issues, create mathematical arguments or gather data to answer a question).
- ☐ **Reflection**—Youth have multiple opportunities for meaningful reflection and making connections between their experiences (facilitator provides purposeful prompts to encourage reflection and sense-making).

Youth Development in STEM

- ☐ **Relationships**—The relationships among youth and with facilitator are positive (consistently positive, creating a warm and friendly learning environment).
- ☐ **Relevance**—Activities are made relevant to youth's lives (more than half of youth are involved in discussing or demonstrating relevance of activities on their lives).
- ☐ **Youth Voice**—Activities encourage youth voice (youth are continually asked to weigh-in on their learning experience and share ideas and opinions, youth take personal or group responsibility for their learning and participation, youth have opportunities to share program/learnings outside the program arena).