Bridge Brief

OUT-OF-SCHOOL STEM LEARNING PROGRAMS FOR NEURODIVERSE YOUTH: TIPS AND RECOMMENDATIONS

Introduction

This Institute for Human Development Bridge Brief explores how out-of-school science, technology, engineering, and math (STEM) programs can better include neurodiverse youth. *Neurodiversity* refers to conditions such as autism, dyslexia, and ADHD, where individuals' brains function differently.

Out-of-school STEM programs offer students opportunities to explore STEM beyond their regular schoolwork. These programs, which take place at summer camps, museums, community STEM events, and after-school robotics clubs, have been shown to increase students' interest and confidence in STEM.[1] Therefore, ensuring all students have access to these programs is vital.

Neurodiverse individuals bring unique strengths to STEM fields, thinking about problems and solutions in creative ways. For instance, research shows that people with autism and dyslexia often excel in pattern recognition, memorization, and mathematics.[2] However, neurodiverse youth may face challenges in some learning environments, such as social interactions, adjusting to changes in routine, participating without accommodations, and maintaining focus on tasks.[3]

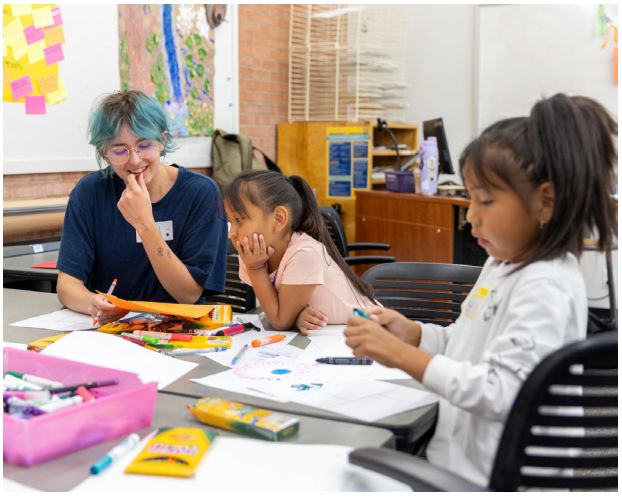
With support from the National Science Foundation, our team examined how out-of-school STEM programs engage neurodiverse youth. We identified strategies that help them participate fully and developed tips for their success in these programs.

What We Learned

To better understand out-of-school STEM programs, our team reviewed academic literature, government reports, business publications, and other online documents.

We identified seven programs that successfully support neurodiverse students in out-of-school settings. Based on these programs' success, we developed the following recommendations for designing STEM learning experiences for neurodiverse youth:

1. *Strengths-Based Approach*: Focus on students' strengths, helping them build on their abilities.
2. *Hands-On Learning*: Offer interactive activities to keep students engaged and excited about STEM.
3. *Flexibility*: Allow students to learn in ways that work best for them, including flexible schedules and breaks.
4. *Accommodations*: Provide different ways for students to participate, ensuring everyone can engage in a way that suits them.



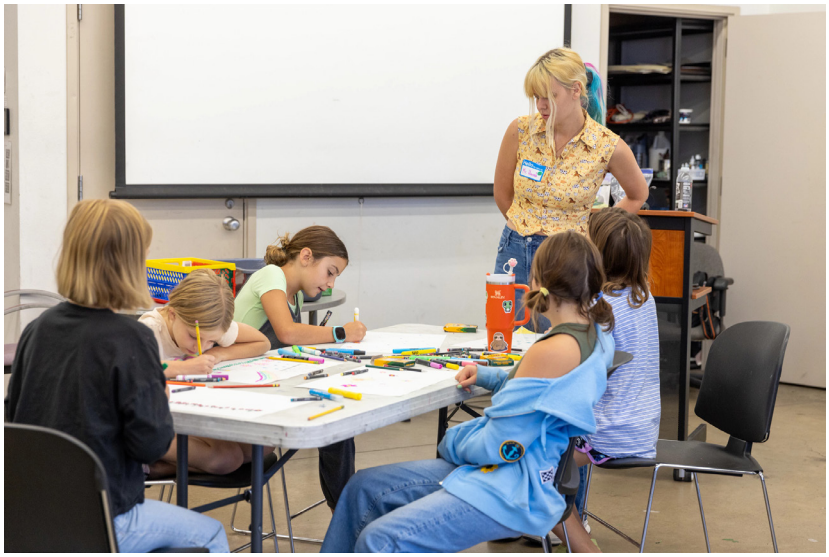
5. *Student-Led Activities*: Let students lead activities, as they may lose interest in adult-led sessions.
6. *Choice and Empowerment*: Give students choices, such as selecting a project topic or presentation method, to boost confidence and help them feel in control.
7. *Social Learning*: Foster teamwork and help students connect with peers who share similar interests.
8. *Training for Leaders*: Equip program leaders with the skills to support neurodiverse students and act as mentors.
9. *Feedback*: Gather input from students, families, and program leaders to continuously improve the program.

These strategies helped neurodiverse youth become more excited about STEM. Program leaders noticed increased confidence as students shared their projects and learned about STEM careers. Many students expressed interest in pursuing STEM professions.

We believe these strategies will enhance STEM experiences for all students, making them more exciting, flexible, and student-centered.

Summary

Neurodiverse individuals bring valuable talents to STEM fields and should have the opportunity to explore these subjects as potential career paths. By following these recommendations, out-of-school STEM programs can become more inclusive and beneficial for all students, including those who think and learn differently.



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OUT-OF-SCHOOL STEM LEARNING PROGRAMS

FOR NEURODIVERSE YOUTH

What Is Out-of-School STEM Learning?

STEM learning outside the classroom can happen in a lot of different places!

Summer Camps | Museums | Robotics Clubs | Libraries

Why Is Out-of-School STEM Learning Important?

Learning about STEM outside of school helps young people

- build confidence in their STEM abilities
- imagine themselves as scientists, programmers, or other STEM professionals
- explore STEM fields

Neurodiverse People Are a Great Fit for STEM Fields!

Neurodiverse people (with conditions like ADHD, autism, and dyslexia) have amazing skills, like

- problem-solving
- seeing challenges in unique ways

But are STEM programs meeting their needs?

RESEARCH RESULTS

We reviewed 2,600 documents and identified 10 informal STEM programs that included neurodiverse students. From this review, we developed 9 recommendations:

Focus on Strengths

Provide Hands-On Activities

Be Flexible

Offer Accommodations

Let Students Lead Activities

Give Choices

Learn Together

Train Leaders

Ask for Feedback

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