STEM and Community Engagement in the Afterschool Environment

CYESS
Collective for Youth Empowerment in STEM & Society
ABOUT EVALUATION + LEARNING CONSULTING

Evaluation + Learning Consulting (ELC) - a New York City and New York State certified Minority and Women-Owned Business Enterprise (MWBE) - is a data-forward consultancy and capacity-building organization that specializes in the delivery of evaluation, research, and training services. ELC is dedicated to bringing an inquiry-based, human-centered approach to the development and delivery of meaningful, impactful engagements. For over a decade, ELC has brought the principles of a data-informed and learning culture to its nonprofit, foundation, and government clients through education, evaluation, and systems development.

Elizabeth DiLuzio was the primary ELC researcher on this study.

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EXECUTIVE SUMMARY

The Collective for Youth Empowerment in STEM & Society (CYESS) – an initiative of the Afterschool Alliance – brings together experts working at the intersection of afterschool STEM learning, youth voice, and civic engagement to collaborate on creating more opportunities for young people to get the experience, skills, and real-world practice using STEM to address issues they care about.

CYESS’ work leverages the expertise of the afterschool field in providing nurturing, supportive environments for young people, and is building the supports needed for adult program providers to offer more youth-driven approaches and create a more robust and productive ecosystem of such opportunities.

This research study was conducted to better understand the current landscape of programming at the intersection of STEM, civic engagement, and youth leadership. The study sought to answer the following questions:

- What are the common core components of these types of programs?
- How do afterschool leaders incorporate community engagement and STEM into programming?
- To what degree are youth involved?
- How are the programs designed, implemented, assessed, and funded?

Common Program Components. The survey revealed that there are clear trends among those who operate an afterschool program that incorporates STEM and community engagement. The greatest number of the survey respondents (50%) facilitated a program that is operated at least in part by a community-based organization or other type of non-profit. Museums or science centers were another common collaborator (54%) for program operations.

Two predominant afterschool models for STEM and community engagement emerged from this study: the local chapters of national models sharing a common curriculum, and the independently operated approaches by community-based organizations like museums, science centers, or non-profits. Each model carried its own set of advantages and challenges.

Incorporating Community Engagement and STEM. Findings indicated a trend towards using community engagement as the bridge that establishes STEM’s relevance and meaning for youth (versus employing STEM initiatives to drive community involvement). When asked about the objectives of the community engagement portion of their programming, survey respondents revealed that the top priority was empowering young people to effect positive change in their communities. When asked about the goals of the STEM portion of their program, the highest ranked was to excite and inspire teens about STEM, followed by building their confidence. The study did not reveal any inherent tension between workforce readiness and a commitment to social justice or other community-oriented goals.

Youth Involvement. Survey responses indicated diverse degrees of youth involvement in program design, with a majority (77%) of programs falling between the second and third highest rungs of Hart’s Ladder, a model for documenting youth involvement that encourages progressing from lower levels of participation, which might only offer tokenistic inclusion, to higher levels where young people’s input meaningfully informs decisions. Notably, 42% of programs were consistent with the third highest rung, where adults established the overarching framework and youth partook in determining its execution. Another significant portion (35%) of respondents aligned their programs with the second-highest rung of Hart’s Ladder. This involves youth taking the initiative to identify issues, plan their projects, and seek adult assistance as necessary.

Assessments. While a few survey respondents were seeking funding for formal evaluation services, most incorporated some form of structured feedback about their program. Their methods were varied, with the most common forms being survey administration (27%), qualitative data collection (e.g., stories, reflections, multimedia; 19%), and some type of assessment either built into the program (e.g., competition results) or distributed to determine change over time (e.g., pre-/post-test; 19%).
**Funding.** The survey revealed a diverse spectrum of funding sources underpinning these programs. A significant 81% of respondents received support through grants from private foundations. Other common funders included federal, state, and/or local governments (50%) and corporate sponsors (46%).

**Challenges.** Interviews with afterschool leaders revealed a few challenges in integrating youth perspectives into their programs. To begin, they often noted the difficulty of balancing a youth-driven approach and the level of adult support needed to help youth formulate attainable solutions to their societal concerns. Project continuity poses another unique challenge when young people select the societal concern they would like to address with their project. While youth-centered, this approach is at risk of creating disjointed efforts over the years as youth leave the program and new participants select different concerns they’d like to address. Finally, this study shed light on a fundamental tension between fully participatory programming and traditional funding models, wherein conventional funding often necessitates a detailed proposal outlining the approach to a predefined problem and its anticipated solutions, while genuinely participatory programming starts without preconceived outcomes.

**Recommendations**
In response to these challenges and the overall state of the field, CYESS recommends the following:

**For Afterschool Leaders**
- **Learn about promising practices from peers.** Their work can serve as models for those wishing to adopt a more youth-centered approach.
- **Plan for project continuity.** Establish ways in which youth can remain involved after they graduate from the program, e.g., through ongoing alumni engagement through structures such as youth leadership boards.
- **Document the broader impact of youth-driven programming on communities.** This will demonstrate to students, funders, and communities the full scope of the impact a youth-led project makes.

**For Funders**
- **Incorporate approaches to funding that support authentic youth-driven and youth-led participatory programming.** This includes application requirements that seek to understand the means by which programs will engage youth instead of the precise nature of the work.
- **Shift expectations around evaluation.** This entails focusing on developmental evaluation approaches instead of requiring measures that assess the program’s outcome or impact.
- **Support the generation and dissemination of evidence to fill knowledge gaps.** Current gaps in peer-reviewed literature include the utility, efficacy, and impact of authentic youth-led, community-driven STEM engagement.
- **Fund new or expand existing networks focused on involving young people authentically in STEM learning and community science.** Such networks can mainstream best practices, share lessons learned, broker relationships between stakeholders looking to collaborate and coordinate tailored professional development and technical assistance for diverse stakeholders.
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I. INTRODUCTION

The Collective for Youth Empowerment in STEM & Society (CYESS) – an initiative of the Afterschool Alliance – brings together experts working at the intersection of afterschool STEM learning, youth voice, and civic engagement to collaborate on creating more opportunities for young people to get the experience, skills, and real-world practice using STEM to address issues they care about.

CYESS work leverages the expertise of the afterschool field in providing nurturing, supportive environments for young people, and is building the supports needed for adult program providers to offer more youth-driven approaches and create a more robust and productive ecosystem of such opportunities.

A critical component of CYESS work is to better understand how youth-serving organizations are currently incorporating youth voice and community engagement into their science, technology, engineering, and math (STEM) offerings. This is essential not only to describe the current opportunities and challenges for this type of engagement but also to determine what supports the afterschool field will need to offer more youth-driven STEM programming that addresses community needs and develops a sense of agency and active citizenship in young people.

In the fall of 2023, Evaluation + Learning Consulting (ELC) was engaged to conduct a research study that sought to answer the following questions:

- What are the basic demographics of these programs (e.g., location, partners, student ages, students served per year)?
- How do afterschool leaders incorporate community engagement and STEM into programming?
- How are the programs designed, implemented, assessed, and funded?
- To what degree are youth involved?
II. METHODS

The data presented in this report were collected using an explanatory sequential mixed-methods approach consisting of surveys followed by a series of in-depth interviews with key informants.

**Survey of Afterschool Professionals**

In a collaboration between Evaluation & Learning Consulting and CYESS, a comprehensive survey consisting of 30 questions was constructed. This survey was disseminated electronically in October 2023 through convenience sampling, utilizing the Afterschool Alliance’s expansive network and social media platforms. The questionnaire was crafted to extract key details about the afterschool programs, such as their locations, partnerships, demographics served, and the number of students engaged annually. It delved into the programs’ structure, their educational objectives, and the degree of community engagement integration. Additionally, the survey gathered optional data, including respondents’ names and affiliations. Participants were also prompted to indicate their willingness to engage in a follow-up interview or to recommend a program participant for further dialogue.

The outreach communication characterized the survey as an opportunity for afterschool professionals who deliver STEM education, foster youth leadership, and encourage community engagement for students aged 13 to 18 to contribute valuable insights. The team believed that there were not vast numbers of programs that would meet all the requirements for this study and made the determination that they would be happy to receive 100 responses. In an effort to incentivize responses, potential survey takers were informed that the first 100 valid responses would receive compensation for their time.

A review of the survey data revealed numerous inconsistencies suggestive of fraudulent activity. These anomalies included nonsensical answers to open-ended questions, recurrent IP addresses, email accounts that mismatched respondent names, and references to non-existent organizations. After eliminating fraudulent responses, it was determined that there were 26 valid survey respondents. Survey data were analyzed using basic descriptive statistics.

**Interviews with Afterschool Professionals**

In January 2024, ELC conducted nine 30-minute interviews and one 60-minute interview with afterschool professionals in English over Zoom. Participants’ programs represented all settings (rural, urban, suburban), sizes (single site, regional, national), and age ranges served (grades 7-8, 9-12). The interviews inquired about the purpose, goals, outcomes, and funding of the programs. Survey transcripts were analyzed via inductive coding using a grounded theory approach.

**Interviews with Program Participants**

In January 2024, ELC conducted four 30-minute interviews with current and former afterschool participants in English over Zoom. The interviews inquired about the skills they need as youth leaders, the ways in which they use STEM in their lives, and details about the program in which they participated. Survey transcripts were analyzed via inductive coding using a grounded theory approach.
III. FINDINGS

This section is divided into three parts, each exploring the research question findings: Basics, which contains the essential descriptives of the programs that participated in this research study; Program Models, which discusses the purpose, design, assessment, and funding of the programs; and Approaches to Engagement and Youth Agency, which analyzes the ways in which youth leadership and community engagement are incorporated into STEM programming.

Basics

The 26 survey respondents represented a wide range of program sizes, ages served, locations, settings, and meeting frequency.

- The median number of students served per year was 185, with a range of 9 to 530,000.
- A majority (81%) of these programs served high school-aged students.
- 14% of respondents reported operating statewide, while 93% reported operating regionally or nationwide.
- Programs spanned all 50 states within the United States, with 12% providing programming in more than one state.
- 42% of the programs operated in a rural setting, 58% operated in a suburban setting, 88% operated in an urban setting, with 54% operating in multiple settings.
- While the meeting frequency was largely dependent upon the type of program and level of funding, programs tended to meet between once per month and multiple times per week.

Program Models

The primary purpose of this study was to dig into the features of afterschool and out-of-school time programming occurring at the intersection of afterschool STEM, teen leadership, and community engagement to answer questions such as:

- What were the main goals?
- How did the design reflect those goals?

Purpose

A crucial portion of this study’s inquiry was into the motivation for incorporating STEM and community engagement together into an afterschool program. Findings from this research study indicated a trend towards using community engagement as the bridge that establishes STEM’s relevance and meaning for youth (versus employing STEM initiatives to drive community involvement).

In the survey, respondents were asked what their STEM goals are for the youth involved in their programming. The highest-ranked goal was to excite and inspire teens about STEM, followed by building their confidence. See Figure 2 for details.
We want them to not just think about what they’re gonna do after high school; we want to help them get there. So part of our program incorporates visits to manufacturing facilities, to medical research facilities. We want [youth] to see how robots are used in the real world, and we want them to meet real world professionals who are working in the field. You enjoy doing this? There is a career for you.”

-Interview Participant

As one interviewee explained, “Excitement and inspiration [are] important because they at least get youth in the door… It’s that first step. It’s the hook.” Once interest is piqued, the challenge shifts to demystifying STEM, making it both approachable and pertinent. Many interviewees reported achieving this by demonstrating the presence of STEM in everyday life, while some aimed to disrupt the stereotypical image of a STEM professional by introducing speakers who reflect the youths’ diverse backgrounds, thus countering the archetype of the ‘white man in a lab coat.’

As is true with any group, there were a variety of motivations to offer STEM-related programming. In the aggregate, those surveyed ranked career preparation as the third most important goal. A few interviewees emphasized that equipping youth with vocational skills was their program’s cardinal objective, achieved either through targeted skills-focused curricula or via corporate partnerships that provide both funding and a potential conduit to future employment in STEM fields.

Survey respondents were similarly asked about the objectives of the community engagement portion of their programming. Their responses revealed that the top priority was empowering young people to effect positive change in their communities, while the lowest priorities were preparing teens for citizenship and engaging teens in the political process. See Figure 3 for details.

The second most common goal was to nurture youth autonomy and amplify their voices, underscoring the importance of self-advocacy and community involvement. These aims support the developmental journey of adolescents as they seek independence and the capacity to make influential choices regarding their self-concept and interactions with others.1

Interviews highlighted the social and emotional competencies that programs aim to foster in young people, such as recognizing the existence of multiple solutions to a single problem and the value of active citizenship. The study did not reveal any inherent tension between workforce readiness and a commitment to social justice or other community-oriented goals. This suggests that afterschool program providers value offering STEM projects for skill building along many different axes.

Figure 3. Average Ranking of Importance

<table>
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<tr>
<td>Enable young people to improve their communities</td>
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<tr>
<td>Support young peoples’ agency and voice</td>
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<tr>
<td>Show young people how to advocate for themselves and their community</td>
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<tr>
<td>Teach leadership skills</td>
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<tr>
<td>Prepare teens for citizenship</td>
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<td>Get young people engaged in the political process</td>
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Design

The design elements of a program—such as frequency, inclusivity in curriculum design, sponsoring organizations, and supportive adult recruitment—play a crucial role in its efficacy and reach.

Surveyed programs typically operated year-round, encompassing school breaks, before and/or after school, and weekends. While 38% operated during all these periods, the majority tailored their schedules for optimal engagement.

Respondents often managed programs aimed at engaging young people who are underrepresented in STEM fields, such as girls, non-binary youth, those from lower socioeconomic backgrounds, and Black, Indigenous, and other youth of color (BIPOC).

Interviews revealed effective engagement strategies such as recruiting leaders who mirrored the participants’ identities and tailoring of curricula to resonate with the targeted demographics. For instance, incorporating meals into the program was important when engaging youth from low-income backgrounds. Emphasizing social justice themes was attractive to girls and young women, who often show strong interest in these areas. Similarly, programming strived to bolster their confidence, acknowledging the societal factors that may affect their self-esteem. BIPOC youth programs were enriched by educating youth about the history of STEM within communities of color, providing an opportunity to educate about its historical damage to the BIPOC community. One interviewee shared that they “think a lot of [the damage] is so generational [that the youth] might not even be able to recognize [it],” emphasizing the importance of helping youth to make sense of their potential biases before engaging.


If you position things [by saying] here’s how this is useful to society at large... then that’s going to be more exciting, particularly for girls. But I don’t think it’s making it less exciting for anyone else either.”

-Interview Participant

The survey revealed clear trends among those who operate afterschool programs incorporating STEM and community engagement. The greatest number of survey respondents (50%) facilitated a program that is operated at least in part by a community-based organization or other type of non-profit. Museums or science centers were another common collaborator (54%) for program operations.

Guest speakers and volunteers were a helpful way for afterschool programs to involve the community and diversify the number of influential voices in a child’s educational journey. One powerful way facilitators made the application of STEM more concrete for afterschool participants was by involving a wide range of professionals to support their participants, most commonly including STEM professionals (69%), community members (38%), and other topic experts (38%). Selecting these guests intentionally to showcase diverse identities and professional backgrounds within STEM can additionally help to present a broader view of the field, directly impacting and inspiring the participants.

These approaches and design elements reflect familiar design elements and considerations for afterschool STEM programs.
The Renaissance Youth Center (RYC), a non-profit organization founded in response to the lack of effective youth enrichment programs in the South Bronx, is a helpful illustration of how community service is used to make STEM more accessible and applicable to youth.

When RYC opened its doors in 2001, its goal was to create a safe haven where community youth could develop lifelong academic and social skills. In its formative years, the organization focused on providing musical and athletic programming. When it first considered the addition of robotics and coding to their offerings, RYC’s leadership visited other robotics programs in the city. They quickly realized that, despite the existence of other programs, there was still a need for a curriculum that youth found fun and engaging while remaining educational.

In response, RYC designed a curriculum that not only includes classic but innovative approaches to engaging youth in STEM. In addition to the classic robotics competitions, RYC incorporates youth interests and perspectives, challenging them to identify a problem they’d like to address through electronics and then mentoring them through the process of building. Youth are first taught about the United Nations’ Sustainable Development Goals (SDGs), which frame 17 global goals the world’s nations should be striving towards. They connect the SDGs with the problems they see in their neighborhoods, understanding that the struggles their communities face are worldwide. They then select an SDG they’d like to take on, developing a local solution to address a global problem using the power of STEM. Ultimately, RYC’s purpose for this type of engagement is not to view STEM as only a career pathway but as a vehicle for nurturing young people into becoming citizens who positively contribute to their communities.

An example of this process in action occurred when youth expressed frustration that local residents were not curbing their dogs outside of the RYC facility. In response, the youth secured bags and garbage cans, adding to the cans a counter that gets triggered every time the lid of the can opens. They introduced the new technology to their neighborhood by hosting a concert for dogs, complete with live music and a light show. Students contributed to the design and construction of the stage, lights, and sound system in addition to its operation during the concert.

In the 2023/2024 school year, RYC students submitted entries to the National STEM Challenge held in Washington DC in April 2024. Three RYC youth were awarded the semi-finalist distinction, and one, Treyonna Sullivan, was designated as the national STEM champion.

In addition to this creative work, youth at RYC have learned and leveraged coding skills to develop SDG-themed websites to educate and inspire youth about the development goals. Websites can be found in the Student Projects section of the Let’s Work Together website.
Approaches to Engagement and Youth Agency

Two predominant afterschool models for STEM and community engagement emerged from the study: local chapters of national models sharing a common curriculum, and independently operated approaches by community-based organizations like museums, science centers, or non-profits. Each model carried its own set of advantages and challenges.

- Leaders from locally-based programs highlighted initial recruitment as a notable hurdle. One leader successfully boosted enrollment by co-hosting events with an already popular program, leveraging its established audience. However, such collaboration wasn’t always feasible in competitive climates where multiple organizations vie for youth engagement.
- National programs, on the other hand, benefited from brand recognition and an extensive network, yet they sometimes grappled with making their content resonate at the community level. To combat this, one leader introduced a flexible curriculum design that allows for local customization facilitated by community representatives. This strategy aimed to enhance the program’s relevance and appeal to the local youth it serves by anchoring STEM learning in their local contexts.

As this study attempted to assess the extent of youth agency in afterschool programming, we applied the framework of the well-known and widely used Hart’s Ladder to group varying approaches. Developed by Roger A. Hart, this model of documenting youth involvement was detailed in his seminal work “Children’s Participation: From Tokenism to Citizenship,” part of the 1992 UNICEF Innocenti Research Centre report. Hart’s Ladder categorizes the levels of young people’s involvement in settings such as education, community development, and policy formation. It encourages progressing from lower levels of participation, which might only offer tokenistic inclusion, to higher levels where young people’s input meaningfully informs decisions. This framework is invaluable for discerning the degree to which youth voice and choice genuinely influence the structure and implementation of programs. See Figure 4 for a visualization of Hart’s Ladder.

Figure 4. Hart’s Ladder

Key Questions
Which level of Hart’s Ladder should our project be on?
Which level of Hart’s Ladder is our project on?
What do we need to do to move to the right level on the ladder for our project?

Quality of Participation

Non-Participation
It is important to remember that tokenism, decoration, and manipulation are not examples of youth participation. You do have the choice to move away from these methods towards more meaningful participation.

Hart’s Ladder

Young people have the idea, set up the project and invite adults to join them in making decisions throughout the project. They are about partners.

Young people have the initial idea and decide how the project is to be carried out. Adults are aware and trust in the leadership of young people.

Adults have the initial idea, and young people are involved in making decisions, planning and implementing the project.

Young people are consulted and informed
Young people are assigned and informed

Tokenism
Decoration
Manipulation

Examples
Young people decide they need a one-stop shop in their community. They partner with adults in different youth organizations and together lobby the government for resources.

A group of students get permission from their principal to run an environmental day. The students make the decisions, and the school provides support.

Adults have the initial ideas, and young people are involved in making decisions, planning and implementing the project.

A community coordinator engages young people for event ideas for Youth Week. The young people suggest having a skating event. The coordinator and young people work together to make decisions and apply for funding.

Adults decide on the project and young people volunteer for it. Young people understand the project and adults respect their views.

A conference creates positions for two young people on a panel of speakers. Young people decide how to select their representatives and work with adults to understand their role.

Young people are asked by adults to be on a panel and represent youth. The young person is not given the opportunity to consult with peers or understand the role.

Young people take part in an event in a very limited capacity and have no role in decision-making.

A group of young people are given a script by adults about “youth problems” to present to adults attending a youth conference.

Adults have complete and unchallenged authority and abuse their power. They use young people’s ideas and voices for their own gain.

A publication uses young people’s cartoons; however, the publication is written by adults.

Survey responses indicated diverse degrees of youth involvement in program design, with a majority (77%) of programs falling between the second and third highest rungs of Hart’s Ladder. Notably, 42% of programs were consistent with the third highest rung, where adults established the overarching framework and youth partook in determining its execution. For instance, in national competitions with themes set by adults, youth exercised creativity and agency in responding to the challenge and strategizing their approach.

Another significant portion (35%) of respondents aligned their programs with the second-highest rung of Hart’s Ladder. This involves youth taking the initiative to identify issues, plan their projects, and seek adult assistance as necessary. The remaining 23% of respondents characterized their programs differently, with specifics illustrated in Figure 5.

Day-to-day operations in these programs, as recounted by interviewees, typically adhere to a structured or semi-structured schedule. This routine often encompasses a community check-in, setting daily objectives, dedicated time for individual or group work, and sessions for sharing outcomes. The inclusion of team-building activities, as mentioned by one leader, complements and reinforces the ethos of youth empowerment that underpins these programs.

### Figure 5. Students’ Role in Program Design and Implementation

1. Young people came up with the idea, set up the project and invite other adults to join them in making decisions as equal partners in the project.
2. Adults decided on the project and young people volunteered to implement the project.
3. Young people researched and defined the problem they wanted to work on. They also decided how the project will be carried out. Adults were available to support as needed.
4. Adults designed and facilitated the idea but young people’s views were given weight in decision-making.
5. Adults came up with the initial idea and young people were involved in making decisions, planning and implementing the project.
6. None of these apply. We had a different process.
7. Young people researched and defined the problem they wanted to work on. They also decided on how the project is to be carried out. Adults were available to support as needed.

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**Great Lakes Science Center**  
*Cleveland, OH*

The robotics initiative at the Great Lakes Science Center in Cleveland is one example of a program in this study that is functioning close to the highest rung in Hart’s Ladder. A few years ago, a youth approached the facilitator with an idea to create prosthetic limbs using a 3D printer and distribute them to people in need. The facilitator asked the youth to draw up a proposal for the project, including a cost-benefit analysis, to demonstrate that the idea was thought-out and feasible. Once convinced, the advisor worked with the youth to set the project in motion.
Assessment and Funding

While a few survey respondents were seeking funding for formal evaluation services, most incorporated some form of structured feedback about their program. Their methods were varied, with the most common forms being survey administration (27%), qualitative data collection (e.g., stories, reflections, multimedia; 19%), and some type of assessment either built into the program (e.g., competition results) or distributed to determine youths’ change over time (e.g., pre-/post-test; 19%). Feedback sought from present participants typically focused on knowledge acquisition and implementation feedback. For example, one interviewee shared her routine of conducting informal monitoring of the program through daily group reflections, allowing youth to voice what they felt succeeded, what could be improved, and what they aspire to accomplish in subsequent sessions. Another interviewee shared that he gauges the success of his efforts to recruit and retain young women and BIPOC youth by analyzing demographic data gathered at registration. On the other hand, insights from alumni aim to shed light on the program’s long-term influence. These insights are typically collected via program participant surveys.

The study survey revealed a diverse spectrum of funding sources underpinning these programs. A significant 81% of respondents received support through grants from private foundations. Other common funders included federal, state, and/or local governments (50%) and corporate sponsors (46%). Interview responses underscored the importance of nurturing relationships with these funders. One interviewee highlighted that successful funding relationships were often those that evolved, demonstrating flexibility and mutual understanding of goals. They recounted how one of their funders initially fixated on the breadth of the program’s engagement but had matured over time to also understand the value of intensive, year-over-year engagement with youth for its deep and long-lasting benefits. This shift reflects a dynamic where both parties adapted and learned from one another, ultimately fostering a symbiotic relationship that enhanced the program’s reach and depth.

“I, personally, am a big fan of reflective practice. [It has] helped me to understand what the teams want to get out of this program, what they feel like their successes have been, [and] what challenges they face or how they want the program to change.”

-Interview Participant

Youth Development Department
Discovery Place Science
Charlotte, NC

The Youth Development Department at Discovery Place Science in Charlotte has dedicated time over the years to cultivating a mutually beneficial relationship with its funders. For example, they invite their funders to visit the program throughout its cycle to see the products the youth have created while engaging with students through meaningful discussion on the topic. In this way, funders can see the real-world effects of their investments. Because their funders see the investment as a way of cultivating a workforce pipeline for the company, the program additionally invites company representatives to table at the program’s career days.
IV. DISCUSSION

There is a heightened awareness in the youth development community of the importance of listening to young people and engaging them authentically. Meanwhile, the importance of gaining STEM knowledge and skills to both access the workforce and be an informed and engaged citizen only continues to grow.

This study was designed to understand how afterschool programs, which are deeply rooted in youth development, are currently incorporating youth voice and community engagement into their STEM offerings to nurture, develop, and center youth agency in society. The findings confirm many known characteristics, opportunities, and challenges of afterschool STEM programs. It revealed diverse entry points into this type of programming – from community engagement to workforce development – and revealed that, no matter the entry point, those shaping programming consistently prioritized supporting positive youth development.

The Assessment and Funding section of this report highlights the evaluation methods most commonly used by the participants of this study. The outcomes they seek to measure vary, but can be grouped into four categories: engagement and retention of targeted populations, skill development – including STEM and community engagement skills – participant satisfaction, and program impact.

Interviews with afterschool leaders revealed a few challenges in integrating youth perspectives into their programs: helping youth formulate attainable solutions to their societal concerns, maintaining project continuity, and finding adequate funding.

As programs move along Hart’s Ladder, the dynamic of control shifts. Initially dominated by adult influence, it gradually moves towards a balance where youth and adults share decision-making responsibilities equally. At the apex of the ladder, the decision-making process becomes a collaborative endeavor where both youth and adults contribute their strengths, fostering impactful and informed actions. For the afterschool programs examined in this study, this shift is especially evident in how the community engagement challenge is framed. Initially, adults set the parameters, creating challenges that fit the program’s scope, timeline, and resources, guiding youth toward achievable solutions. As a program ascends the ladder, youth begin to take the lead in identifying issues pertinent to their experiences. While this empowerment of youth voice and agency is vital, it also highlights the expertise gaps they might have in addressing these problems. Some youth may rush into solutions without fully understanding the underlying issues, propose ideas that exceed the program’s practical limitations, or struggle to find any response to the societal concerns they’ve identified. Adults can fill these gaps with their knowledge of resources, societal dynamics, and strategic civic engagement, supporting passionate youth who might lack certain key insights.

The challenge when giving students the agency to do this work is figuring out the right way to coach them if they are taking on an enormous problem. We are trying to find the slice of it that is tangible enough that they can work on it and succeed. What is the right amount to let them tread water in the STEM space [without overwhelming them]?

-Interview Participant

To illustrate this point, an interviewee shared an example of a young boy who wanted to design collars that stopped one of his cats from bullying the other. “So I am contacting electrical engineers that I know to ask what the right type of thing is that would trigger [based on] proximity… I didn’t want to put this on the young person’s shoulders because I didn’t want to quickly overwhelm him and be like ‘you need an advanced degree in electrical engineering to know this stuff’. And I saw my job as exploring the possible pathways… but also narrowing the solutions to a couple of options that I think can work.”
Project continuity poses another unique challenge when young people identify issues they tackle that might be highly meaningful to them. With it lies an inherent risk of creating disjointed efforts without a sustained commitment from participants, who will eventually move on from the program. While it’s beneficial for different youth cohorts to tackle a variety of societal issues or even approach the same issue from fresh angles, there’s the potential pitfall of engaging in projects that only scratch the surface, falling short of the deeper societal impact they aim for. For instance, one program recounted the development of an educational board game by a group of youths passionate about spreading STEM knowledge. They introduced the game to local schools and engaged with younger students. Yet, once that set of youth moved on, the game was left unused, symbolizing the challenge of maintaining project momentum.

Finally, this study shed light on a fundamental tension between fully participatory programming and traditional funding models. Conventional funding often necessitates a detailed proposal outlining the approach to a predefined problem and its anticipated solutions. However, genuinely participatory programming, which embodies the essence of youth input at every stage, often starts without preconceived outcomes. This creates a conundrum for leaders committed to embracing a fully participatory ethos, as it may restrict their access to the funding necessary to initiate or sustain such programs.

Despite the challenges, the programs in the study shared remarkable results. From enhancing youth’s social networks, improving their social skills, and increasing their interest in STEM, youth-centered programming is making a positive impact. As the STEM field increasingly influences our lives and society, it is critical that we continue to make connections between young people’s interests and issues they care about and STEM. The knowledge and tools they gain will not only support their preparation for meaningful careers but also prepare them to lead civically engaged lives.

What keeps me engaged is being able to connect with my peers that are passionate about... the same things that [I’m] concerned about. I’ve met so many climate friends.”

-Youth Interview Participant
V. RECOMMENDATIONS

Based on the findings of this study, the following recommendations are for afterschool program leaders and funders who seek to engage youth in STEM and community engagement programming.

Afterschool Program Leaders

- **Learn about promising practices from peers.** There are many excellent programs and organizations working to incorporate youth voice and community civic engagement into their STEM programming. These can serve as models for those wishing to consider this approach. For example, a number of leaders interviewed for this study shared that they have youth work in groups to design their projects, effectively consolidating the number of projects seeking their support and guidance. Others have established structured processes and activities that lead students step-by-step through the process of defining a problem to be addressed and brainstorming potential solutions, effectively narrowing down their projects to achievable goals. Yet others implement daily progress logs, enabling leaders to provide asynchronous support, which ensures continuous guidance even when they can’t meet with every group in each session.

- **Plan for project continuity.** This can take many forms, depending on the nature of the solution the youth have designed. For example, this might incorporate time for succession planning when youth are reaching the end of their project. In the example of the board game project described in the discussion section, this may have consisted of the young people identifying a classroom or doctor’s office that would be interested in incorporating the game into their toys available for youth. Other programs may seek to develop pathways for alumni engagement. Still others may retain the initially identified problem and local solution to be addressed, engaging new cohorts of youth to continue engaging in the initially identified topic and/or project.

- **Utilize youth organizing frameworks to enhance project sustainability.** Another way programs can ensure continuity is through the establishment and ongoing utilization of structures such as youth leadership boards or advocacy groups. Whether or not the identified cause changes over time, structures that include youth in decision-making and advocacy can always be leveraged. Frameworks such as the Youth Engagement Continuum, as defined by the Funders’ Collaborative on Youth Organizing (FCYO; see Appendix 1), outline the nature of these forms of engagement.

- **Document the broader impact of youth-driven programming on communities.** Provided the preeminent goal of community engagement programming is to empower young people to effect positive change in their communities, impact measurement should not stop at the program’s impact on the youth participants. Instead, it should extend to include the degree to which youth make a sustainable and long-term impact on the beneficiaries of their project. For example, Mikva Youth proudly reports that their students’ advocacy contributed to the creation of a free public transportation service for youth in the Washington, D.C. area. Documenting these broader impacts of youth engagement will be critical in building support for the routine inclusion of young people in the agenda-setting and decision-making that occurs in communities.

The Afterschool Alliance’s Youth Voice Toolkit is designed for programs to explore the spectrum of youth voice work, tools, and examples from partners at each level of youth involvement, as well as best practices in the field. See [https://www.afterschoolalliance.org/YouthVoiceToolkit/](https://www.afterschoolalliance.org/YouthVoiceToolkit/).

Read about programs working at the intersection of afterschool and out-of-school-time STEM, youth leadership, and civic engagement on the CYESS website [https://cyess.org/projects/cyess-partner-blogs/](https://cyess.org/projects/cyess-partner-blogs/).
Funders

- **Incorporate approaches to funding that support authentic youth-driven and youth-led participatory programming.** Funders can support participatory program design through application requirements that seek to understand the proposed means by which programs will engage youth instead of the precise design of the project. This enables program leaders to truly co-design the scope of the project with its youth participants.
  - Allocate dedicated funding to involve young people so programs can cover the additional costs of involving young people effectively in both one-off projects and more long-term, sustained initiatives.
  - An example of working with youth to design more inclusive funding opportunities can be seen in the UK-based Esmee Fairbairn Foundation’s incorporation of the Involving Young People Collaborative. In the United States, NOAA has launched the eeBLUE Young Changemakers Fellowship program to incorporate young people to influence decision-making at the highest levels of the agency.

- **Shift expectations around evaluation.** Another way in which funders can support participatory programming is by focusing on developmental evaluation approaches instead of requiring measures that assess the program’s outcome or impact. This shift in expectations focuses on the quality of the program’s feedback loops instead of seeking performance measures on program designs that have not yet been developed.
  - Strengthen and standardize the monitoring and evaluation of young people’s involvement in community-driven STEM engagement. By consistently tracking how young people are involved and the broader outcomes of that involvement for both the young person and the community, the lessons learned will be accessible to others. Moreover, it will help build a stronger evidence base to garner more support for this type of work.

- **Support the generation and dissemination of evidence to fill knowledge gaps.** Current gaps in peer-reviewed literature include the utility, efficacy, and impact of authentic youth-led, community-driven STEM engagement.

- **Fund new or expand existing networks focused on involving young people authentically in STEM learning and community science.** Such networks of practitioners, researchers, and other organizations can mainstream best practices, share lessons learned, broker relationships between stakeholders looking to collaborate (including young people), and coordinate tailored professional development and technical assistance for diverse stakeholders.

The Afterschool Alliance launched the Collective for Youth Empowerment in STEM & Society (CYESS) initiative in recognition of the need to support programs to make deeper connections between STEM, youth leadership, and civic engagement. CYESS addresses needs identified in this report by: building community among practitioners, enhancing capacity of the wider afterschool field, and conducting research and communications to advance practice. The CYESS website can serve as a starting point for program providers wishing to explore more youth-led, community-driven STEM initiatives. See https://cyess.org.
VI. APPENDIX 1: YOUTH ENGAGEMENT CONTINUUM

Credit: Funders’ Collaborative on Youth Organizing (FCYO)
VII. Appendix 2: Survey respondents

- Adler Planetarium
- Biomimicry Institute
- California Academy of Sciences
- Children's Museum Indianapolis
- Da Vinci Science Center
- Digital Harbor Foundation
- Discovery Place
- FIRST (For Inspiration and Recognition of Science and Technology)
- Girls Who Code
- Great Lakes Science Center
- Indiana University
- Long Island Children's Museum
- Maven Youth
- Mikva Challenge
- Million Girls Moonshot
- National Girls Collaborative Project
- New York Hall of Science
- North American Association for Environmental Education
- Renaissance Youth Center
- Science Museum of Minnesota
- Smithsonian Science Education Center
- Teen Science Cafe Network
- The Wild Center
- trubel&co
- University of Florida