NIOST
National Institute on Out-of-School Time

Out-of-School Time STEM Workforce Retention

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Overview and Rationale

The National Institute on Out-of-School Time (NIOST) at Wellesley College, with generous support from the Overdeck Family Foundation, conducted an investigation of effective strategies for recruiting, training, and retaining a high-quality out-of-school time (OST) STEM workforce. We have investigated these issues across different geographic locations, program types, and program populations in combination with broad perspective gathering from OST STEM educators and program directors. Through this work we expect to inform program leaders and educators how to best obtain, prepare, and retain staff to deliver high-quality STEM activities in OST programs. Developing a strong and effective OST STEM workforce is a priority for the OST field. We expect the findings to illuminate promising pathways to strengthen OST STEM staffing and STEM learning delivery. This Issue Brief #2 focuses on retention of OST staff delivering STEM activities. There is demand for STEM programming in OST programs nationally and programs are challenged to retain staff needed to deliver those high-quality STEM activities. Findings from this study point to the value of managing some of the key features of work experiences such as time off, flexible work hours, and full-time positions, along with providing an organization foundation for belonging and employee meaning.

Method and Sample

This mixed-methods investigation included OST program STEM activity observations in 25 programs along with 33 interviews with STEM program activity leaders in a selected sample of those programs. Program observations and interviews took place in five states: Alaska, Georgia, Massachusetts, Minnesota, and Wyoming.

High-quality STEM activities were identified by the study team's use of the Assessment of Program Practices Tool (APT) STEM Activity section. The APT is a field-tested and validated program observation instrument which includes assessment items on STEM Activities including nature of activities, staff and youth engagement, and evidence of STEM skill practice and mastery based on the Next Generation Science Standards.[1] The APT was developed by NIOST in partnership with the MA Department of Education 21st CCLC Program and is currently being used throughout Massachusetts as well as 35 states nationwide.[2] The APT observation was completed by a NIOST researcher and quantitatively analyzed based on an item scale of 1 (low, not true) to 4 (high, very true). Researchers identified high-quality STEM activity implementation in order to identify skilled STEM Educators for in-depth interviews.

The overwhelming majority of STEM-educators interviewed for this study and observed delivering OST STEM activities held bachelor or higher degrees. Activity quality data collected via the APT indicated a "high-quality" level of STEM activity delivery. Following quality validation through the APT observation, STEM activity leaders were invited to an interview with the NIOST researcher. Semi-structured 45-minute interviews were primarily conducted on site following the observation. Program staff were asked to: (a) describe their roles and responsibilities; (b) share about their work history and what attracted them to the STEM OST workforce; (c) provide insight into their education, STEM background, and interests; (d) clarify the potential impact of a variety of professional development experiences; and (e) offer their opinion on what it takes to most effectively recruit, train, and retain staff who can deliver high-quality STEM activities in OST programs. The 33 program staff who participated

[1] Available at https://www.nextgenscience.org/

[2] Tracy, A., Surr, W., & Richer, A. (2012). *The Assessment of Afterschool Program Practices Tool (APT): Findings from the APT Validation Study*. Wellesley, MA: National Institute on Out-of-School Time.

in the interviews reported their demographics as: Female – 23; Male – 9; Non-binary – 1; White – 18; Black – 6; Hispanic – 2; Mixed Race – 2; Asian – 2; Non-disclosed – 2; Native American/Alaska Native – 1. Interviewees reported the following age categories: 20-30 years (17); 30-40 years (12); and over 40 (4). Each interviewee was offered a $20 gift card delivered digitally to remunerate their time devoted to the interview.

Interviews were recorded via laptop, phone, or digital recording device. Following recording, each interview was downloaded to a secure storage file and then analyzed using NVivo software. All transcripts were coded by two members of the research team. Initial coding themes were based on the interview framework. Themes were refined and added to given the patterns and content of interviewee responses. Bi-weekly meetings of the research team were used to discuss thematic analysis and support the writing process.

In addition to interviews, NIOST developed and disseminated the National OST Program Director Survey on the OST STEM Workforce. The research team collaborated with organization leaders in the five geographic target regions. A total of 2,406 survey responses were received between January 8 and July 17, 2025. A randomized $25 gift card drawing was offered each of the weeks the survey was open. After cleaning and eliminating incomplete responses, a final set of 1,547 responses was analyzed. All 50 states were represented in the response sample. Sixty-five percent of the respondents identified themselves as Program Director/Program Supervisor/Program Coordinator. There were 40 items on the survey including multi-choice, rating, and Likert scales with a skip-pattern implemented based on STEM workforce characteristics.

Secondary Analysis of the Power of Us Survey

The Power of Us (POU) study conducted by American Institutes for Research (AIR) in 2022-2023 included a survey of OST professionals in the United States. The survey gathered responses from over 10,000 current and former youth fields staff and volunteers from all 50 states (Moroney et al., 2025). NIOST conducted a secondary analysis of these survey data with a focus on staff who work or volunteer at programs that deliver STEM content (N = 1,524). Because of the structure of the survey, we began by filtering responses by the type of activities offered by the program. We then conducted some analyses, where the sample was large enough, using responses from staff who work at programs where STEM and no other subject matter is delivered (N = 639). We refer to this population as “staff who deliver STEM (no other subject).”

We conducted two analyses using this data. First, we analyzed participation in various kinds of training and professional development as predictors of satisfaction with aspects of professional life. We used ordinal logistic regression to assess the association between the selection of a binary variable (e.g., “participated in professional networking”) and a response selected from a 4-level Likert scale, from strongly disagree to strongly agree (e.g., “To what extent do you agree with: ‘I see myself as part of a larger community’”). Second, we conducted Wilcoxon rank sum tests to compare responses of staff who work at programs where STEM is delivered to responses of staff who work at programs where STEM is *not* delivered. This tests for the statistical significance of the difference of mean Likert responses.

Background

High staff turnover is a long-standing challenge for the OST workforce (Grossman et al., 2002; National Academies of Science, Engineering, and Medicine, 2025; Starr et al., 2023; Yohalem & Pittman, 2006). Finding and keeping staff remains a top concern for programs (Afterschool Alliance, 2025). Many factors impact this high turnover, especially low compensation, high job stress, and lack of advancement

opportunities (Halpern, 2000; Moroney et al., 2025; Starr et al., 2023; Yohalem & Pittman, 2006). However, even in light of these challenges, the workforce has consistently reported a high degree of job satisfaction and expressed commitment to the field (Moroney et al., 2025; Yohalem & Pittman, 2006). It is common in the OST profession to leave a job or organization, but remain in the field. In the Power of Us workforce survey, most respondents reported having had between two and five different jobs in the OST field over their careers (Moroney et al., 2025). This turnover, even within the field, can still contribute to upheaval for programs and youth.

Research has illuminated some nuance in the OST turnover data, pointing towards the existence of relative stability in some roles with simultaneous "churn" in other roles (Wilkens, 2020). At one large, national child care program, researchers found that high turnover occurred alongside high retention – 63% of field roles remained stable, while 37% repeatedly turned over. Most of the turnover occurred with part-time staff. This study also examined the role of managers, finding that changes in managers' mindsets related to locus of control, accountability, and focus on employee retention can positively impact retention rates (Wilkens, 2020). Recently, discussion in the field has placed emphasis on workplace quality, including compensation, to strengthen workforce supports and increase retention. The National AfterSchool Association's (NAA) Job Quality Standards (NAA, 2024) outlines several "pillars" of job quality, namely Support (training and professional development, acknowledgement, and performance management), Opportunity (career development and mentoring/coaching), and Voice (participation, improvement, and engagement), along with the "core" elements (job descriptions and postings, interviewing, onboarding, pay, hours and scheduling, benefits and employee assistance, inclusion, and safety).

Other research has explored the link between full-time jobs and staff retention at OST programs. For example, The City of Cambridge OST Expansion Study (Cambridge Agenda for Children, 2025) found a strong correlation between working hours and retention: within the Cambridge OST sector, attrition rates for staff working fewer than 30 hours per week were as high as 44%, compared to just 6% for those in full-time positions. In addition, innovative OST Registered Apprenticeship models have been shown to positively impact staff retention (Partnership for Children and Youth, 2023). STEM programs that have used creative salary structures aimed at increasing consistency and stability of pay (not necessarily increasing total compensation), namely switching from a Per Diem model to annual salaries, have seen increases in STEM educator retention rates (Chesapeake Bay Outward Bound School, 2025).

High turnover has also impacted OST STEM programs specifically (Afterschool STEM Hub & Afterschool Alliance, 2025; National Academies, 2026). The Afterschool STEM Hub, a collaborative project led by the Afterschool Alliance, engaged program providers, educators, professional development leaders, and youth over a two-year period to gather input on key challenges in recruiting and retaining OST STEM educators. Key challenges identified included: an inability to compete with market wages for STEM staff (noncompetitive wages, limited benefits, part-time roles), unclear career pathways for OST STEM educators, and lack of STEM-specific professional development (Afterschool STEM Hub & Afterschool Alliance, 2025). To address these challenges, programs are experimenting with various strategies, including training local college students and former participants to serve as STEM educators, offering personalized STEM curriculum design and built-in time off, access to peer support networks, and creating collaborations with schools, businesses, and higher education institutions to help supply materials, expertise, and learning opportunities. We hope findings from our current study help to identify and understand challenges to retention of OST STEM educators, and effective strategies that contribute to keeping them.

Findings

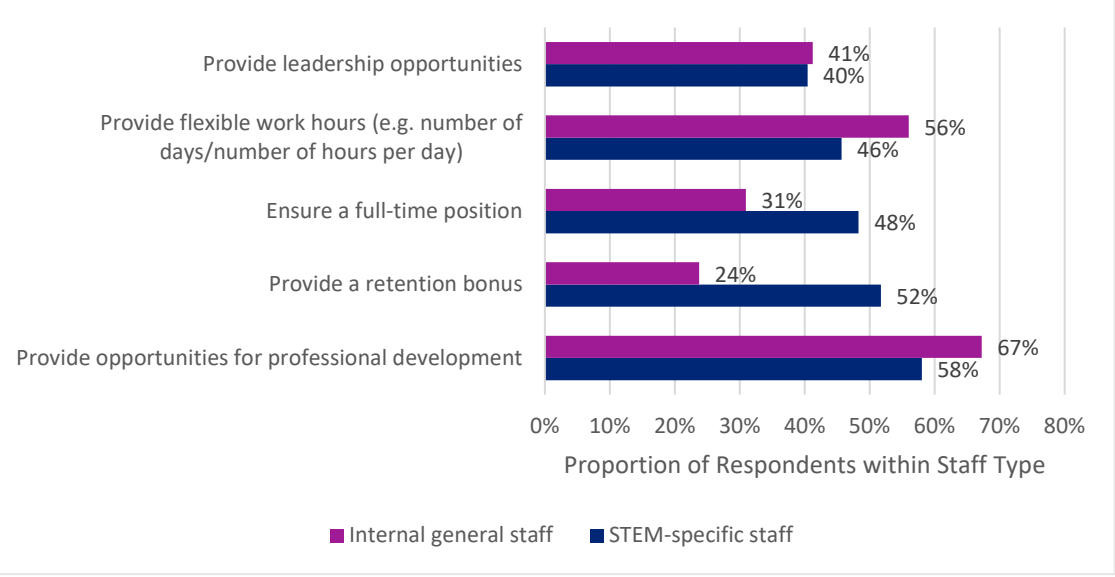
Many Strategies…Mixed Results

The Program Director Survey yielded helpful information about how OST programs approach staffing for STEM activity delivery. Almost half (45%) of the program directors responding to the survey reported relying on their own general staff to deliver STEM activities. Thirty-one percent (31%) of program directors reported hiring STEM-specific staff to deliver STEM activities. Survey results also showed that programs use a variety of strategies to retain staff who deliver STEM, including providing staff recognition, regular performance feedback, opportunities to include staff voice, professional development opportunities, leadership opportunities, flexible work hours, benefits, retention bonuses, and offering full-time positions. These are all common strategies for OST workforce retention (Afterschool Alliance, 2023; Afterschool STEM Hub & Afterschool Alliance, 2025), and promote the "pillars" of workforce supports that NAA outlines in the Job Quality Standards (NAA, 2024).

Directors using the two different OST STEM educator staffing models also show variation in their retention strategies. At programs that leverage internal staff to deliver STEM programming, directors especially rely on connecting staff to professional development opportunities, offering flexible work hours, and promoting staff recognition. Alternatively, program directors hiring STEM-specific staff to deliver STEM programming, while also promoting professional development, reported retention bonuses and full-time position offerings a greater proportion of the time compared to directors from programs relying on internal general staff (see Figure 1). Thirty-seven percent (37%) of program directors hiring STEM-specific staff also reported paying those staff higher wages than "regular staff."

Figure 1

Retention Strategies Compared Across Staffing Types



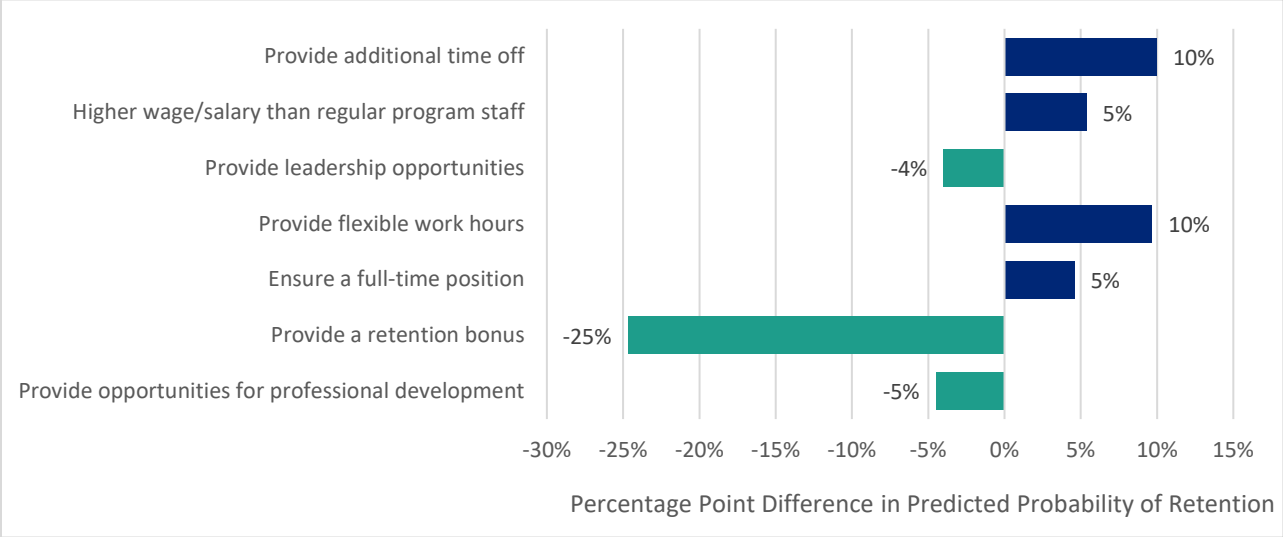
Retention data from the Program Director Survey shows that implemented strategies have mixed associations with STEM-specific staff retention. As shown in Figure 2, some of the most commonly utilized strategies by program directors with STEM-specific staff are associated with decreased odds of retention. Program directors who indicated the use of retention bonuses had a 25% lower predicted probability of retention compared to the overall population surveyed.[3] Similarly, providing opportunities

[3] Differences in predicted probabilities are based on the difference between a probability based on the average odds of retention across the sample (baseline odds), and a probability based on the odds of retention given a particular selection (baseline odds * Odds Ratio).

for professional development, and providing leadership opportunities were associated with lower predicted probabilities of retention (-5% and -4% respectively). These negative associations may be due to reverse causation. For example, directors may implement retention bonuses in response to retention issues. This would make it more likely that those offering bonuses have comparatively lower retention outcomes. Other retention strategies are associated with increased predicted probability of retention. Offering additional time off, higher wages, flexible hours and full-time positions are retention strategies that were associated with increased predicted probability of retaining staff (Figure 2). Program directors that indicated the use of these strategies were more likely to report favorable retention outcomes compared to the overall population of program directors surveyed.

Figure 2

Retention Strategies and Differences in Predicted Probability of Retention (STEM-Specific Staff)



Job Schedule Flexibility Has Value

Providing additional time off and providing flexible work hours showed the greatest impact on staff retention of OST STEM-specific educators. Staff who employed this strategy were 10% more likely to retain staff over two years. Those program directors who reported providing additional time off and flexible work hours were also more likely to report greater staff retention. In fact, flexibility predicted staff retention stronger than additional pay and providing professional development, two of the most commonly reported strategies.

Many interviewees (14) spoke about the value of flexibility and work-life balance, pointing to the connection between job flexibility and retention. They mentioned that the schedule structure (e.g., after school, part-time, full-time on school holidays, specific start times that aren't compatible with other second job schedules) is a challenge. Having extra staff capacity, including the form of substitutes, was a specific strategy that allows for flexibility and was mentioned by several program directors. One director noted:

> *It's not a bad college job, because there's no nights, no weekends. We're pretty flexible on days off. If you need a day off, we make sure we have enough subs that can work. (Program Director)*

Another director mentioned:

> *We're very flexible, that's the other thing. We definitely have these, "you have to be here for this," but the whole reason [the co-director] and I are also there is, for whatever reason*

> *someone can't make it, we can support or cover. So, we tend to have a floater [who] can come…help wherever there needs to be cover. (Program Director)*

The Power of Us Workforce Survey (Moroney et al., 2025) found that one in six respondents (16%) selected more flexibility in work hours as a desired change to their jobs. Respondents ages 18–25 were more likely to identify this aspect as a desired change compared to respondents age 55 and up (18% and 12%, respectively). Although these respondents included general staff as well as OST educators working in STEM-only programs, the desire for increased flexibility is apparent especially for younger staff.

Not the Front-Runner, but Compensation Still Matters

Based on survey results, compensation was not the strategy that most highly predicted staff retention – nor was it the most commonly cited issue by our interviewees related to retention. Workplace culture, staff voice and autonomy, and flexibility were cited more often as valued features of an OST employment experience. However, compensation was still a positive predictor of staff retention (difference in predicted probability of + 5%), as was providing full-time positions (+ 5%), which is connected to higher salaries.

Program directors and educators spoke about pay as an obvious baseline for retaining staff.

> *The pay is definitely, on our part, the big influencer. (Program Director)*

> *If you want somebody to work in this type of environment, and you want them to do a good job, and to want to come to work, and to not consider other roles, you have to compensate them fairly. (STEM Educator)*

Perceived prospects for upward mobility with a potential pay increase may also be a catalyst for staff retention. One program director said:

> *I think a lot of kids who know they are going to stay more local for college, or stay online, stick it out through the younger years of their high school because they will have a shot at a classroom and a significantly higher pay. (Program Director)*

As part of the Power of Us study (Moroney et al, 2025), staff who deliver STEM (no other subject, N = 639) were asked about several aspects of work satisfaction. Of all the dimensions of work satisfaction they were asked about, they were least likely to endorse feeling fairly paid. While a definition of fair pay was not provided, common understanding of fair pay might include consideration of experience, performance, responsibility, or benefits.

The Significance of Promoting Belonging for STEM Educators

In discussions of organizational development and workforce support across all professions, it is likely that the notions of belonging, voice, and feeling valued are interwoven. Knowing your voice is heard creates a sense of being valued, joined by a comfort and identification with a group or community. Analysis of the Power of Us data showed that staff who deliver STEM (no other subject) were less likely ($p < 0.01$) to see themselves as belonging and part of a larger youth fields community (1.65 average score on a 4-level Likert scale, from strongly disagree to strongly agree) compared to staff who work at other programs (1.74 average score). This group was also less likely to report a feeling of belonging at their own organization (1.68 vs. 1.73, $p < 0.01$), and to feel committed to youth fields as a career path (1.23 vs. 1.30, $p < 0.01$). The broader Power of Us study also found variations in feelings of belonging based on role, tenure in the field, age, and race/ethnicity.

Interviewees referenced belonging and related concepts many times in their comments. One program director who supervises STEM educators, reiterated the importance of having a workplace community with a culture of support and belonging:

> *I think work culture is very important. If you're running your staff into the ground, and there's no staff appreciation, or opportunities for them to enjoy what they're doing, they're less likely to come back. I have staff [who] work for me from school year to summer, summer to school year…But I also think of the culture. No one's going to go back to an environment where they don't feel appreciated or get recognized. (Program Director)*

STEM educators (21) spoke about the importance of valuing staff and staff voice specifically as an effective retention strategy. They highlighted the importance of voice and contribution in the workplace as factors that keeps them in their organizations. One STEM educator said:

> *And I think just including me in the conversation…just hearing where we're currently at and what we have capacity for. And when [my supervisor] has an idea, he'll bring it to us and instead of being like, "Hey, we got this grant, you have to run this program now," it's more like, "Hey, we're thinking about going for this grant, can you help us craft the narrative and figure out how this could fit into your space if it does?" (STEM Educator)*

Another interviewee commented;

> *One of the biggest things I think…from the experience that I had last summer, I might not have returned if I didn't have so much agency and input and how to change things for this year. I've really appreciated having my experience valued and my input valued and my ideas implemented. So, I think that is probably the number one factor…that helped me stay. (STEM Educator)*

Figure 3
Employee Belonging in the OST Workplace

The reasons why OST STEM educators may experience less belonging could relate to a variety of factors. We describe in our research brief "Out-of-School Time STEM Workforce Recruitment" that STEM-educators may often lack youth development experience or training, and consequently miss inherent connections to community and children that may be more likely experienced by youth development-experienced staff.[4] Figure 3 delineates a conceptual framework for understanding belonging in the OST workplace based on our study findings. Synthesis of qualitative interview data from OST STEM educators alongside quantitative metrics from the Program Director Survey and the Power of Us study, suggest that institutionalizing mechanisms for appreciation, contribution, and recognition can cultivate STEM educator's sense of voice, connection, and an enhanced perception of feeling valued in the OST workplace. While impact/agency, team-building, and voice/choice are frequently intentional pedagogical approaches in OST program youth work, these same practices seem less commonly integrated into OST workforce

[4] https://www.niost.org/NIOST-News/new-niost-project-to-build-stronger-evidence-on-recruiting-training-and-retaining-a-high-quality-ost-stem-workforce

onboarding and orientation experiences and may be key drivers in promoting OST STEM workforce retention.

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