

10 Years of Supporting STEM Learning Beyond the School Day

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Abstract

Click2Science supports out-of-school time programs that help youth develop STEM thinking, skills and mindsets that prepare them for the future. We work with youth development professionals and educators in-person and virtually, to develop effective strategies for reaching youth, increasing STEM skills, and nurturing interest and engagement with STEM. This poster summarizes 10 years of impact from Click2Science project and three web sites: Click2SciencePD.org supports developing the skills that make STEM click; Click2Engineering.org focuses on engineering for everyone; and Click2ComputerScience.org focuses on helping youth to find their potential in computer science. It will discuss the impact of on-going work supporting STEM beyond the school day and new trends in professional development for staff in out-of-school time programs.

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The Click2Science Project Supports STEM Learning

The Click2Science project supports out-of-school time programs that help youth develop STEM thinking, skills and mindsets that prepare them for the future. We work with youth development professionals and educators in-person and virtually, to develop effective strategies for reaching youth, increasing STEM skills, and nurturing interest and engagement with STEM.

This poster summarizes 10 years of impact from Click2Science project and three web sites:

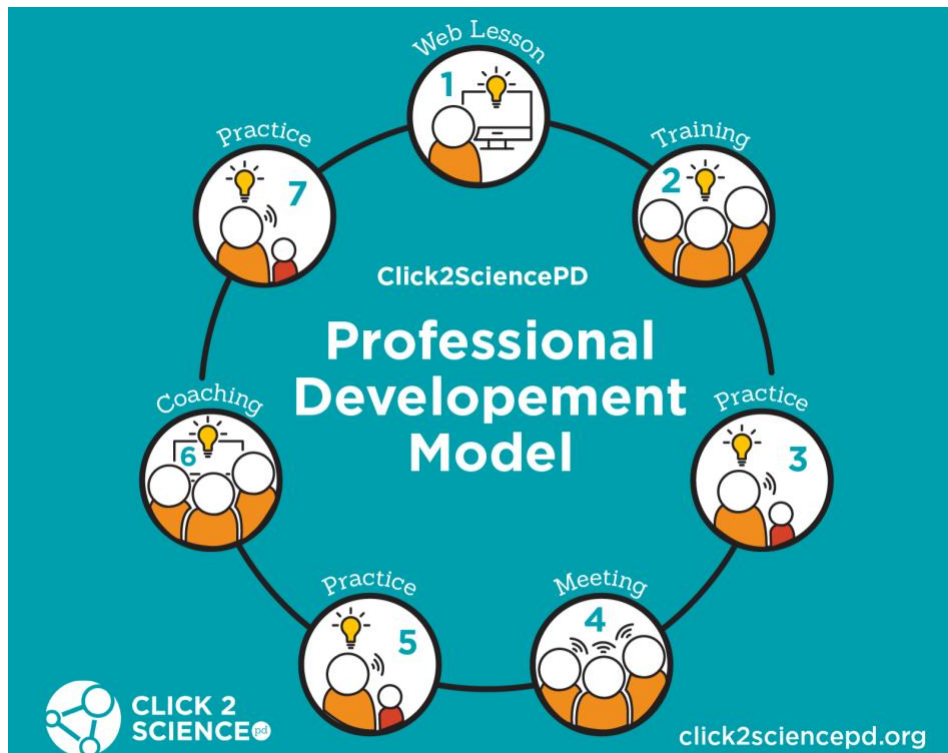
- Click2SciencePD.org supports developing the skills that make STEM click.
- Click2Engineering.org focuses on engineering for everyone.
- Click2ComputerScience.org focuses on helping youth to find their potential in computer science.

Click2Science builds capacity for STEM learning with a blended model of professional development

The Click2Science approach to PD for OST programs focuses on capacity building. We create resources to support and train staff in OST programs that are not costly in terms of cost or time. We have found that low-cost resources available on-demand can address many of the challenges out-of-school time programs face in providing quality STEM programming.

The Click2SciencePD model of professional learning focuses on developing a particular skill, like asking purposeful questions, over time through a series of connected learning experiences. This

approach blends training, coaching and independent, online learning experiences together ([A Model for Out-of-School Educator Professional Learning](#), 2018).



Value of STEM Learning Beyond the School Day

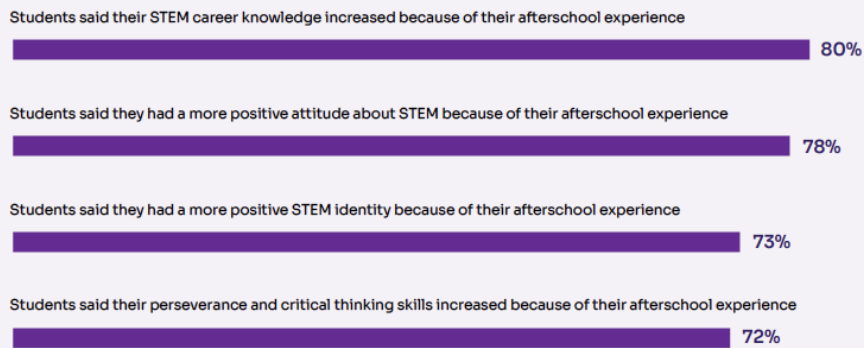
Informal out-of-school environments provide unique opportunities to reach youth, particularly youth who are underrepresented in STEM fields.

Out-of-school-time (OST) programs can improve attendance and engagement in school ([Harnessing the Power of Afterschool and Summer Programs to Support Recovery and Reengagement](#), 2021). Afterschool STEM learning develops STEM skills and proficiencies. Children come to value STEM fields and begin to see themselves as potential contributors to STEM ([The Impact of afterschool STEM](#), 2016).

Parents, especially Latinx, Asian American and Black parents, see how afterschool programs increase their children's interest and skills in STEM ([America After 3PM STEM Learning in Afterschool on the Rise, But Barriers and Inequities Exist](#), 2021).

STEM learning isn't just about preparing the future workforce. As technology advances, everyone will use STEM skills in their work, for their health and in their daily life.

Figure 2: Large-scale study supports role of afterschool STEM in improving attitudes and interest in STEM
In a study by the PEAR Institute of 160 afterschool STEM programs serving 1,600 students across 11 states:*



From a multi-state study of investment in afterschool STEM in [STEM Ready America: Inspiring and Preparing Students for Success with Afterschool and Summer Learning](#), 2017.

Staff Development Supports STEM Learning Beyond the School Day





Youth outcomes in out-of-school programs are strongly associated with program quality.

“Evidence shows that afterschool programs that provide high-quality STEM learning experiences are making an impact on participating youth.” ([The Impact of afterschool STEM](#), 2016)

Afterschool program providers have identified recruiting, training and retaining staff as some of their biggest challenges ([The State of Afterschool Programs: Results of a National Survey on Programming During a Pandemic](#), 2022). Stable, consistent staff are necessary to create a positive environment for children ([Evidence for Action: Strengthening After-School Programs for All Children and Youth: The Massachusetts Out-of-School Time Workforce](#), 2005). OST program quality is dependent upon staff qualifications, instructor interactions, and materials. Professional development (PD) affects the practices of OST staff, and these practices affect outcomes for youth ([Promoting Quality Through Professional Development: A Framework for Evaluation](#), 2004). Staff who have PD opportunities report feeling more confident and more satisfied with their jobs ([The Importance of Professional Development for Youth Workers](#), 2006). Researchers recommend targeted PD for facilitators to improve the quality of STEM learning opportunities for youth in OST ([From quality to outcomes: a national study of afterschool STEM programming](#), 2019).

Opportunities for children to experience STEM learning in their afterschool program have expanded in the last 10 years, but opportunities for staff to develop their skills in leading STEM learning experiences have not.

Figure 4: Growth in STEM offerings in afterschool

ACTIVITY	2014	2020
STEM overall	69%	73%
 Science learning	46%	49%
 Technology and engineering	30%	39%
 Math activities	60%	62%
 Computer science	N/A	41%

Afterschool opportunities to learn science, technology and engineering, and math are more available now than in 2014. From [America After 3PM STEM Learning in Afterschool on the Rise, But Barriers and Inequities Exist](#), 2021

Virtual and In-Person Workshops

The Click team supports OST programs by providing virtual and in-person. We have had a steady increase in both the number of people directly reached by our workshops and the hours PD provided. In 2023 the team provided **369 hours of professional development** and in 2024, this has grown to **803 hours** of professional development for staff in OST programs.

Impact of workshops is increased through growth.



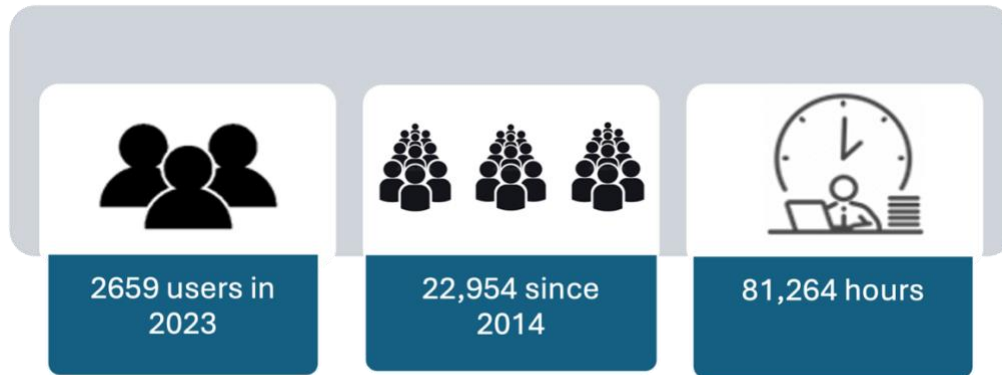
85% told us the workshop they attended helped them be a more effective professional.

Independent Learning

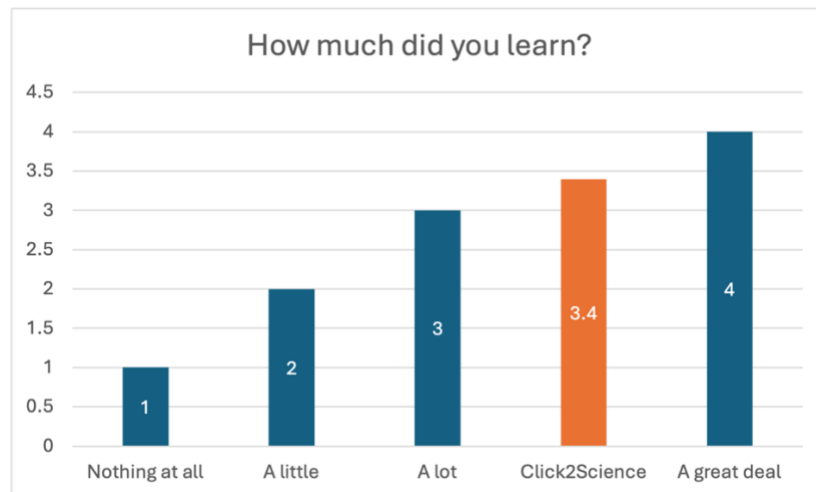
Opportunities for independent learning that staff complete online and at their own pace make professional development more accessible for many out-of-school time programs. [Click2Science's self-directed modules](#) reach a broad audience and provide more opportunities for learning than is

possible through direct training alone. There are 20 modules that reach thousands of out of school providers each year.

Impact of independent learning increases over time.



In 2023, 2659 individuals completed one or more modules online. More than 22,000 people have completed these modules since the first four were launched in 2014, providing 81,264 hours of staff training in 10 years.



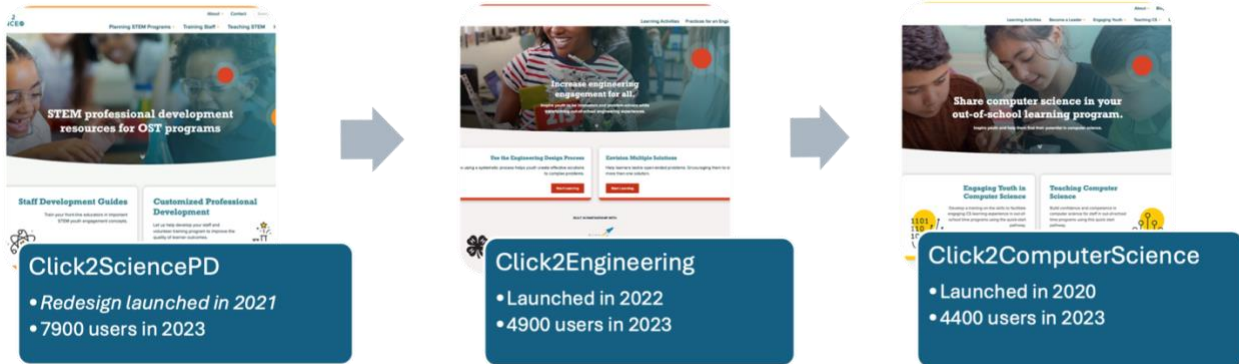
OST staff who used the self-directed resources online report that they learned a lot from the modules they completed – the average response is 3.4 on a 4-point scale, the range of response are between 3.33 to 3.47. The modules users learn the most from are:

- Testing Testing 1-2-3 - rated 3.47 by 653 users
- Developing a Science and Engineering Identity - rated 3.45 by 1277 users
- Connecting to a STEM Career - rated 3.45 by 1787 users
- Creating a Safe Space for Stem Learning - rated 3.43 by 3040 users
- Minds-on Learning – Reflecting and Processing in STEM - rated 3.43 by 768 users

Digital Communication

Click2Science had 4473 email subscribers who received 10 messages from our team in 2023. The average open rate for this type of communication is 21%. Our open rates ranged from 22% to 42% which is slightly above average for our field.

Out-of-school time program staff are more confident in teaching STEM than they were 10 years ago, recently Click2Science has seen a growing need for support in engineering, math and computer science learning in out-of-school time programs. Because our primary connection to our audience is through the Click web sites, new sites were developed to meet the growing need in the cutting-edge areas of STEM learning. [Click2ComputerScience.org](https://www.click2science.org) focused on supporting youth finding their potential in computer science, was launched in 2020. [Click2Engineering.org](https://www.click2science.org) launched in 2022, focuses on engineering for everyone and developing an engineering mindset. Together, the three sites had 17,200 users in 2023.



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