

STEM TEENS PROJECT

Examining the role of youth educators as learners and teachers in informal STEM learning sites



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PROJECT OVERVIEW

A 5-year research-practitioner partnership between six Informal STEM (science, technology, engineering & mathematics) learning sites (science centres, museums, zoos, and aquariums) and universities based in the United Kingdom and the United States of America. This project was funded by Wellcome Trust, ESRC (Economic and Social Research Council) in the UK, and the NSF (National Science Foundation) in the USA.

OUR GOAL

Examine the impacts of STEM teen programs on **teens'** learning and engagement

Examine the impacts of STEM teen programs on **visitors'** learning and engagement

OUR PARTNERS



University of Exeter

NC STATE UNIVERSITY



UNIVERSITY OF CAMBRIDGE



UNIVERSITY OF South Carolina



wellcome



Economic and Social Research Council



RESEARCH

KEY FINDINGS

Benefits to youth



INTEREST, MOTIVATION & SOCIAL SKILLS

When youth feel like they belong in their program, they report increased interest in STEM subjects, academic motivation in STEM, and social skills.

FUTURE CAREER ASPIRATIONS

Social and STEM-related skills are essential for developing STEM career aspirations and future success in STEM careers. Participation in youth programs develops these skills.



LEARNING & ENGAGEMENT

Youth's learning and engagement in STEM decline over time, but participation in youth programs counters this decline.

Benefits to visitors



LEARNING & ENGAGEMENT

Children and adults learn and engage more when interacting with an educator compared to those without an educator.

GIRLS' INTEREST IN MATH

Girls report more interest in math after interacting with female educators than male educators.



CONVERSATION & ENGAGEMENT

Conversations with educators provide opportunities for children to think deeply about the exhibits, ask questions, and provide explanations about STEM concepts.



scan here to learn more
from our publications on the
STEM Teens website



THINGS TO CONSIDER

WHEN STARTING A YOUTH PROGRAM

“ *Successful teen programs do not operate in isolation* ”

Practitioner partner



FIND OUT THE LOCAL NEEDS

- Contact local schools or other organisations to find out what activities and opportunities are available and what is missing.
- Design activities that could be beneficial to your target group.
- Determine the overall outcomes you would like to see in your program.
- Consult young people in your communities.



REACH OUT & NETWORK

- Reach out to organizations outside of your area with similar missions to find out how they've developed their programs.
- Adapt existing programs and tailor them to meet your local needs.
- Partner with researchers and other organisations to improve your programs using evidence-based best practices.



RECRUITMENT & RETENTION

- Develop a rigorous and fair volunteer selection process and training routine.
- Find ways to encourage everyone to join, not just those who can afford to. Pay them for their time and travel, if possible.
- Many returning teens enjoy their volunteer service mainly because they are valued.
- Show respect and value the teens as you would your full-time staff.



TAILORED EXPERIENCE

- Throughout the year the needs of young people change, so be flexible and adapt activities to their interests
- Ask young people for feedback.
- Create an environment that allows volunteers to thrive.
- Support, nurture, and value your teens.
- Use experienced volunteers and staff to mentor new ones.
- Create an inclusive and welcoming environment for all.

YOUTH PROGRAMS

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CENTRE OF THE CELL, LONDON

Centre of the Cell at Queen Mary University of London is the first informal science learning centre in the world to be located within a working biomedical research facility.

Alongside two dedicated public engagement spaces for science shows and workshops, Centre of the Cell has a Youth Membership Scheme (YMS). The YMS is a free scheme for 14-19 year olds which runs throughout the year and offers volunteering opportunities, a summer school, and support to those interested in careers in healthcare and biomedical science.

On average there are about 500 members of the scheme at any one time.



EDVENTURE COLUMBIA, SC

EdVenture's Museum Apprenticeship Program (MAP) is a year long commitment that fosters youth as they learn the service, leadership, and employability skills necessary to successfully progress into adulthood.

MAP volunteers are aged 11 to 17. They are trained and paired with staff to work on exhibits interpretation, exhibit refabrication, and assist education with the facilitation of floor programming, groups, camps and events. They can also participate in professional development opportunities such as meeting presenters and researchers throughout South Carolina.

On average, we take in 17 to 20 youth volunteers every year.

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RIVERBANKS ZOO & GARDEN COLUMBIA, SC



Riverbanks Zoo and Garden Zoo Teen program provides High School students with an interest in animals and conservation an opportunity to explore science careers and skills. Teens engage with professionals in the field, travel to in-situ and ex-situ conservation sites and apply learning and skills to engagement opportunities with Riverbanks' guests. The enrolled teens have largely been guests or program participants at our facility for many years.

Each year Riverbanks enrolls 55 youth in the program with many returning for multiple years of learning and service.

THINKTANK BIRMINGHAM SCIENCE MUSEUM

Thinktank's Science and Heritage Career Ladder (SHCL) recruits and pays 6 young people aged 16 and 17 each year. They work over the summer holidays to train in science communication.

The museum also runs youth panels which organise pop-up exhibitions, programming, and takeover days. Additionally, the museum offers volunteer work placements for young people aged 15 and above who are interested in gaining experience in museum work and science communication.

These three programs attract approximately 50- 60 young people each year.



VIRGINIA AQUARIUM & MARINE SCIENCE CENTRE

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The Virginia Aquarium offers year-round opportunities for teenagers interested in marine and environmental science. The experiences enable teens to learn about Virginia's marine habitat, global conservation programs, and sustainable practices.

Watershed Warriors gives teens the opportunity to promote environmental science and habitat conservation to diverse audiences.

Over the summer, they educate the public on the importance of watersheds and offer guests a chance to see their impact on the environment with hands-on experiments and interactives.

The Aquarium has 138 teen volunteers.



RESEARCHERS & PRACTITIONERS TEAM

Scan QR code to learn more about the STEM Teens project from our website



Website:

<https://sites.google.com/ncsu.edu/stemteens/home>



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QUOTES

BY STEM TEENS

“I learned about how to fit into a workplace because all the people who worked there were in university. I was in secondary school. So, I learned how to work with different age groups and how to fit into a setting and it gave me many life skills”

“ Oh, this is actually so helpful because it helps me for my future, my career, how to talk to people. How to be more confident”

“Allowed me to see what different STEM paths had to offer and just knowing what different paths had to offer, helped me to decide which one of those things I actually wanted for myself”

“ I never put my hand up in class, you know, but at the science museum I would watch my peers doing the same things as me, and you know, boosted my confidence like if they can do it so can I”

“ (I developed) sort of time management skills with running events, and participating in research”