Education and STEM-driven outreach with intention and impact

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Controlled Release Society Annual Meeting
July 25, 2023

UNIVERSITY *of* WASHINGTON

Many purposes and forms of outreach

Purpose:

Value alignment:
Increase accessibility to STEM fields and skilled-driven research opportunities

Form & Scope:

Educational, exploration, skill development?
Content
Frequency
Engagement expectations

Measurable Impact:

Track & assess outcomes
Get Feedback
Measure what matters – are you achieving your goal and aligned with your purpose?

Sustainability:

What can be programmatic?
What are the rate limiting steps?
Documentation is important.

Example 1: STEM outreach via Women in Chemical Engineering

WChE

Est. 2016

University of Washington

Women in Chemical Engineering's (WChE, "Wick-ee") primary purpose is to educate, empower, and advocate for individuals who identify as women and non-binary in chemical engineering, and their supporters through professional development, community networking, and **outreach to primary, secondary, and post-secondary institutions**.

Outreach, service, and partnerships

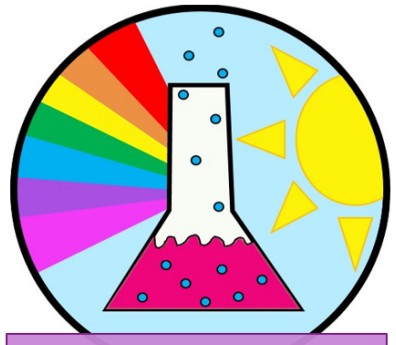
Purpose: Raise awareness of and increase opportunities to explore chemical engineering and related subjects, particularly for women, non-binary, and historically marginalized individuals

Annual WChE Outreach Event: Introduce a Girl to[ ]…

Gabriella Tosado
Creator of the 'Introduce a Girl' series
Ph.D., Chemical Engineering, 2020
WChE Outreach Director 2017-2018

Introduce a Girl to [ ]

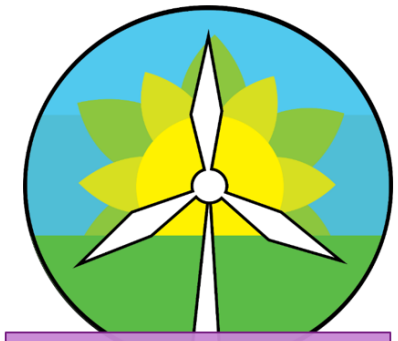
an annual outreach event featuring themed, hands-on demos for aspiring young scientists!



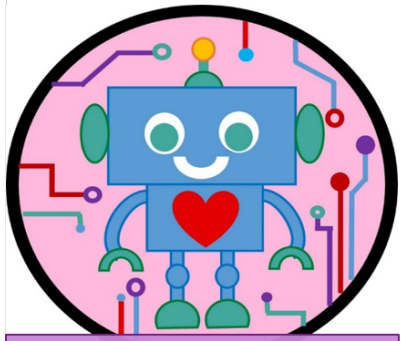
Photonics - 2016

Nanotechnology - 2017

Bioengineering - 2018

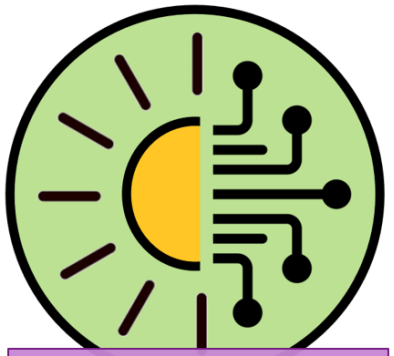


Renewable Energy - 2019



Co.R.DS. - 2020

Biotechnology - 2022



Green Tech - 2023

In the last 7 years….

2,741
student attendees

87
Hands-on demos

29
Participating student organizations

WChE

Example 2: Educational outreach via the Nance Lab

- High school & undergraduate research opportunities can be limited or inaccessible for to a variety of reasons: financial, connections, awareness, time
- Training students is time intensive
- Mentors (faculty, PIs, postdocs, grad students, etc) are time-limited
- Training needs can come at irregular intervals
- Those with expertise graduate….as one should
- Application to available position ratio has been significantly out of proportion (25-35 applications for everyone 1 position)

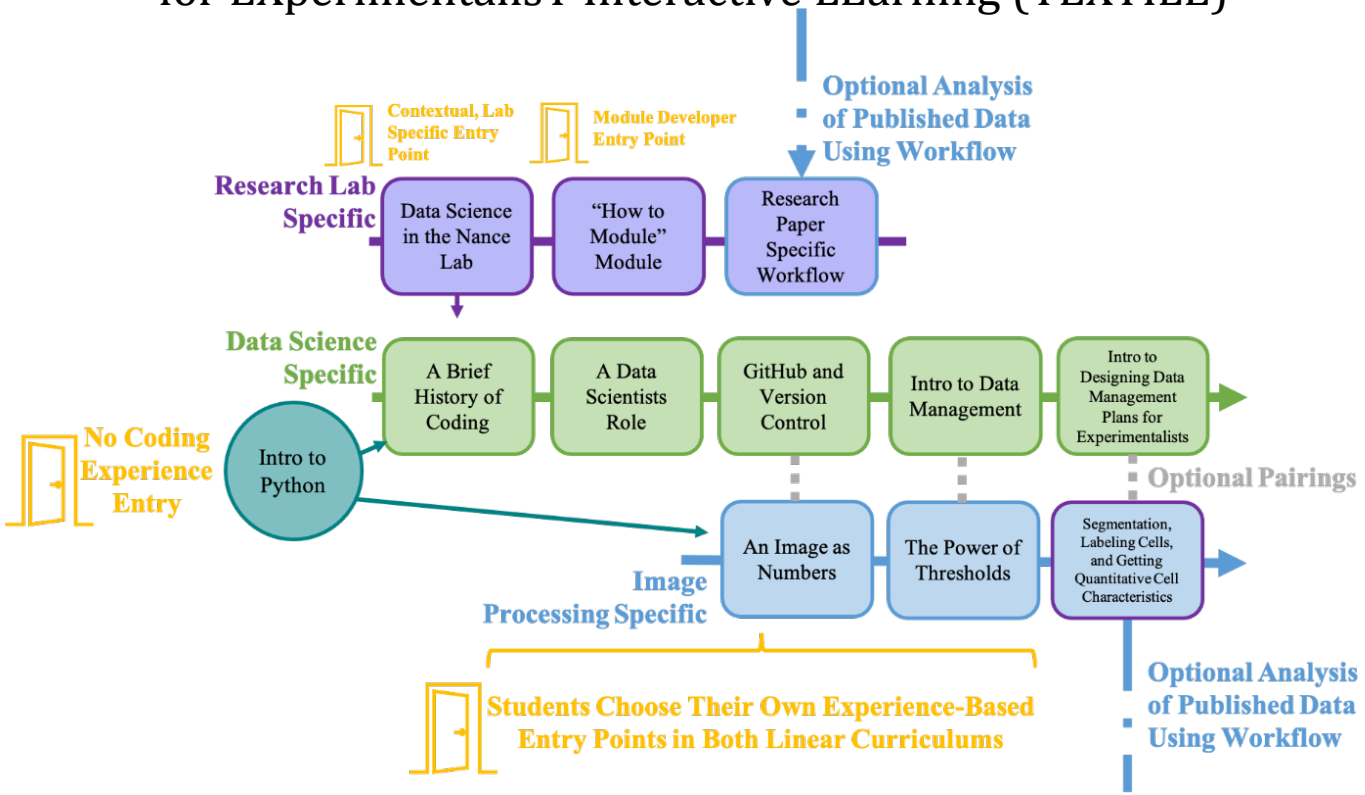
How do we increase access to our research and to research skill development in a time efficient, level-independent manner?

Example 2: Educational outreach via the Nance Lab

To increase the number of students who can participate in high school and undergraduate research opportunities in our research lab, we developed Tutorials for EXperimentalisT Interactive LEarning (TEXTILE)

Hawley Helmbrecht
Ph.D., Chemical Engineering, 2023

Creator of TEXTILE



TEXTILE is an interactive semi-linear module based curriculum for training students at various educational levels on data science methodologies currently utilized by experimental engineering and bio-focused research laboratories.

Helmbrecht H., Nance E.* *Chemical Engineering Education* (2022); doi: 10.18260/2-1-370.660-129820

TEXTILE: a semi-linear, modular curriculum

logo created with BioRender.com

Ongoing efforts:
- Continued module expansion
- Building a self-guided asynchronous format
- Converting to integrate on the EdX platform

In the last 3 years….

87
student participants

62%
High School Participants

17
Modules developed

100%
Placement into STEM majors

Helmbrecht H., Nance E.* *Chemical Engineering Education* (2022); doi: 10.18260/2-1-370.660-129820

Summary & Acknowledgements

- Pursue activities that are value aligned
- Think of what most accessible/available to you
- Measure what matters (having fun matters too)
- Think sustainability (change is natural and documentation is your friend)

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Seattle Children's HOSPITAL · RESEARCH · FOUNDATION

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2015-2016 Founding WChE Officers: Kate Schultz, Monica Esopi, Paisley Zelaya, Emily Ruskowitz, Elena Pandres, Binh Dang, Amanda Levenson, Angela Kimber (not pictured)