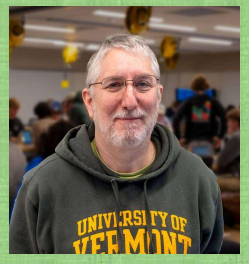
SOCKS Teacher Academy:
Graduate Certificate in Computer Science Education

Regina Toolin and Lisa Dion

Education and Workforce Development Co-Leads

Clayton Cafiero, Jackie Horton and Murat Gungor – CSE Instructors





VERMONT EPSCoR

NSF EPSCoR
ADVANCING GEOGRAPHIC DIVERSITY IN STEM

S.O.C.K.S.
SCIENCE OF ONLINE CORPORA, KNOWLEDGE, AND STORIES

SOCKS TEACHER ACADEMY COHORT 1

VERMONT EPSCoR

NSF EPSCoR
ADVANCING GEOGRAPHIC DIVERSITY IN STEM

S.O.C.K.S.
SCIENCE OF ONLINE CORPORA, KNOWLEDGE, AND STORIES

Goals and Objectives: SOCKS teachers will learn to align their teaching to the Computer Science Teachers Association (CSTA) learning standards and the VT Agency of Education Computer Science Endorsement Standards, resulting in computer science licensure eligibility for teachers

	Milestones					
Activities	Year 1 - 2023-24	Year 2 – 2024-25	Year 3 – 2025-26	Year 4 – 2026-27	Year 5 – 2027-28	**Responsible Parties**
Establish and manage the SOCKS Teacher Academy in Computer Science Education, 18-credit computer science licensure certificate	Hire CWPE Staff, Develop and submit graduate certificate in CSE for approval	Cohort 1: 13 teachers, 3 courses (9 credits) per year in CSE	Cohort 1: 12 teachers, 3 courses (9 credits) per year in CSE	Cohort 2: 12 teachers, 3 courses (9 credits) per year in CSE	Cohort 2: 12 teachers, 3 courses (9 credits) per year in CSE Output: 24 new teachers	Toolin, Dion, CWPE Staff (Simkins, Jones)
Recruit and educate teachers from across Vermont in advanced computer science topics and pedagogical methods.	Hire CWPE Staff, Establish Webpage, Recruit Cohort 1 Spring 2024	Cohort 1: 13 teachers	Cohort 1: 12 teachers, Recruit cohort 2 (Fall and Spring 25-26)	Cohort 2: 12 teachers	Cohort 2: 12 teachers	Toolin, Dion, CWPE Staff (Simkins, Jones)

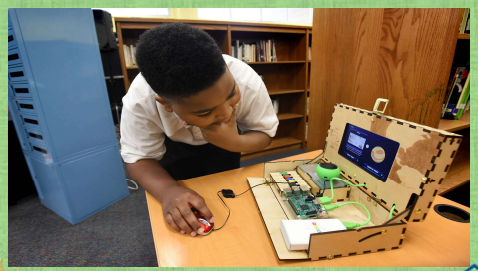
VERMONT EPSCoR

NSF EPSCoR
ADVANCING GEOGRAPHIC DIVERSITY IN STEM

S.O.C.K.S.
SCIENCE OF ONLINE CORPORA, KNOWLEDGE, AND STORIES

Goals and Objectives: SOCKS teachers will learn to align their teaching to the Computer Science Teachers Association (CSTA) learning standards and the VT Agency of Education Computer Science Endorsement Standards, resulting in computer science licensure eligibility for teachers

	Milestones					
Activities	Year 1 - 2023-24	Year 2 – 2024-25	Year 3 – 2025-26	Year 4 – 2026-27	Year 5 – 2027-28	Responsible Parties
Provide comprehensive support including tuition support for graduate certificate program, and resources for their classrooms	Hire CWPE Staff	Cohort 1: 13 teachers, provide teacher tuition support and resources	Cohort 1: 12 teachers, provide teacher tuition support and resources	Cohort 2: 12 teachers, provide teacher tuition support and resources	Cohort 2: 12 teachers, provide teacher tuition support and resources	Toolin, Dion, CWPE Staff (Simkins, Jone)
Provide professional development funds (including funds to attend the yearly CSTA conference or code.org training) and access to HPC time with the VACC	Hire CWPE Staff	Cohort 1: 13 teachers	Cohort 1: 12 teachers	Cohort 2: 12 teachers	Cohort 2: 12 teachers	Toolin, Dion, CWPE Staff (Simkins, Jones)



VERMONT EPSCoR

NSF EPSCoR
ADVANCING GEOGRAPHIC DIVERSITY IN STEM

S.O.C.K.S.
SCIENCE OF ONLINE CORPORA, KNOWLEDGE, AND STORIES

Summary of Progress to Date

AY 2023-24 - 18-credit Graduate Certificate in Computer Science Education (CSE) developed and submitted for review (College and Faculty Senate Curricular Affairs Committees)

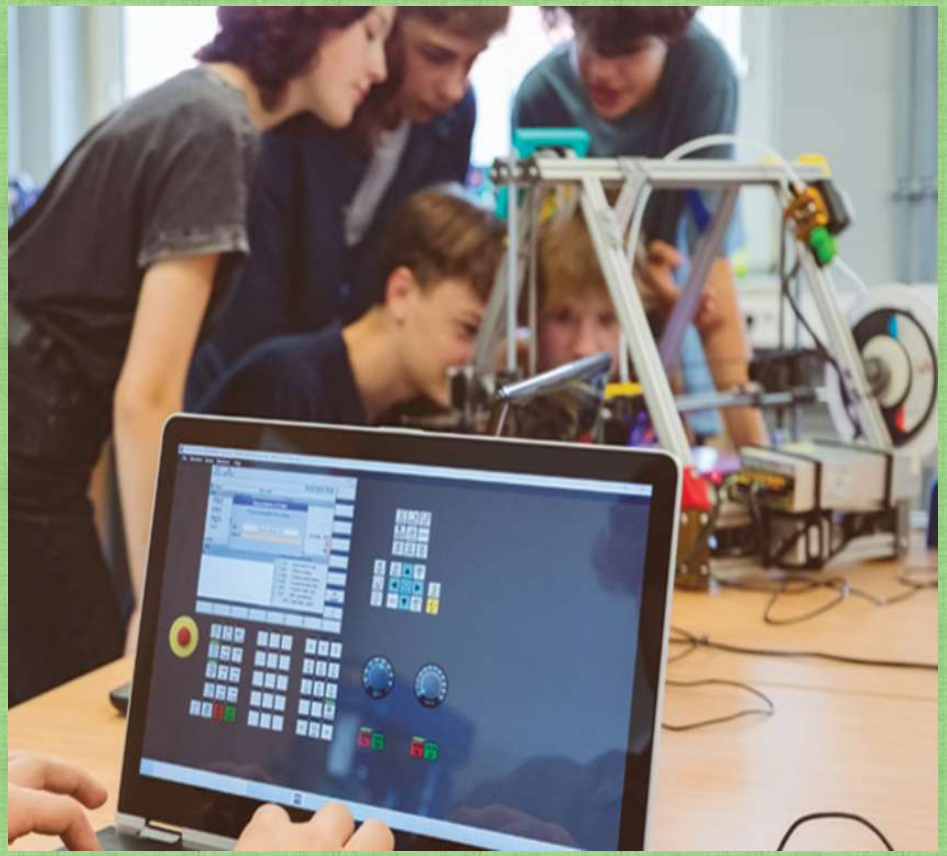
May 2024 - CSE approved by the UVM Board of Trustees

May to August 2024 – CSE Program marketing and recruitment

13 Teachers enrolled in CSE Cohort 1 – Fall 2024 (1 teacher left the program due to childcare needs)

CSE is designed to meet teachers' needs and schedules. Courses are offered sequentially, one course a semester, online during evening hours. Upon program completion, teachers will be eligible for licensure in Computer Science (7-12) through the VT Agency of Education.

CSE Sequence of Courses
EDCI 5001 Python Programming for Educators
EDCI 5002 Java Programming for Educators
EDCI 5003 Web Design for Educators
EDCI 5004 Computer Organization for Educators
EDCI 5005 Data Science For Educators



Outcomes

- Summer 2024 - 15 teachers applied, 13 teachers awarded scholarships, 12 are currently enrolled in the CSE program.
- Fall 2024 – Fall 2025 - Cohort 1 successfully completed EDCI 5001, 5002, 5003, & 5005. Currently enrolled in 5005 – Data Science for Educators
- October 2024 – Toolin (CSE Program Lead) – Presented “AI Applications in Teacher Education” at EPSCoR National Conference, Omaha, NE.
- November 2024 & June 2025 - 4 teachers attended the AI Vermont Teacher Workshops
- Fall 2024 and Spring 2025 - 3 guest presentations by SOCKS researchers/staff in EDCI courses
- January 2025 – CS Teacher Panel – Panel of VT CS teachers presented to the Java course
- April 2025 - 2 CSE teachers presented at a STEM Teacher Panel in Teaching Science in Secondary School Course at UVM
- November 2025 – Toolin & 2 CSE teachers (Gregory and Keith) attend VT FEST at Killington to recruit Cohort 2.
- Fall 2025- Spring 2026 – Ongoing recruitment for CSE Cohort 2 – 12 teachers accepted and awarded scholarships for Fall 2026

VERMONT EPSCoR

NSF EPSCoR
ADVANCING GEOGRAPHIC DIVERSITY IN STEM

S.O.C.K.S.
SCIENCE OF ONLINE CORPORA, KNOWLEDGE, AND STORIES

2024-26 SOCKS Teacher Academy Cohort 1

2024-26 SOCKS Teacher Academy Cohort 1
Milton Town School District, Milton, VT – Science Teacher
Danville School, Danville, VT – Design and Technology Instructor
Burr Burton Academy, Manchester, VT – Computer Science and Tech Integrationist
Stowe HS, Stowe, VT – Mathematics Teacher
Brattleboro HS, Brattleboro, VT – Mathematics Teacher
Missisquoi Valley School District, Missisquoi, VT – Education Technology and Data Manager Administrator
Vergennes HS, Vergennes, VT – Science Teacher
Blue Mountain Union HS, Wells River, VT – Mathematics Teacher
Winooski HS, Winooski, VT – Science Teacher
Shelburne MS, Shelburne, VT – Social Studies Teacher
Spaulding HS, Barre, VT – Mathematics and Computer Science Teacher

VERMONT EPSCoR

NSF EPSCoR
ADVANCING GEOGRAPHIC DIVERSITY IN STEM

S.O.C.K.S.
SCIENCE OF ONLINE CORPORA, KNOWLEDGE, AND STORIES

2026 SOCKS Teacher Academy Cohort 2

2026 SOCKS Teacher Academy Cohort 2
Bellows Falls Union High School, Bellows Falls, VT - Science and Health Teacher, Science Department Coordinator
U-32 Middle & High School, East Montpelier, VT - Teacher Librarian
Spaulding High School, Barre, VT - STEM Coordinator
Middlebury Union High School, Middlebury, VT - Math Teacher
Danville and Walden Schools, Danville, VT - Literacy Interventionist
Manchester Elementary-Middle School, [Manchester, VT] - Middle School Math and Science Teacher & District STEM Chair
Orleans Central Supervisory Union, Glover Community School, Glover, VT - Social Studies Teacher
South Burlington High School, South Burlington, VT - Math & Statistics Teacher
Franklin Northeast Supervisory Union, Sheldon Elementary School, Sheldon, VT - PK-8th Grade Principal
River Valley Technical Center, Springfield, VT - Information Technology Instructor
Otter Valley Union Middle and High School, Brandon, VT - Health, Family and Consumer Science and STEM Teacher
Charleston Elementary School, Charleston, Vermont – Mathematics Interventionist Teacher

VERMONT EPSCoR

NSF EPSCoR
ADVANCING GEOGRAPHIC DIVERSITY IN STEM

VERMONT
EPSCoR

S.O.C.K.S.
SCIENCE OF ONLINE CORPORA, KNOWLEDGE, AND STORIES

Broader Impacts

- The SOCKS Teacher Academy (CSE Certificate)
  - ➢ will increase (potentially double) the number of certified teachers (currently only 17) who will teach CS courses in grades 7-12 in Vermont.
  - ➢ will increase CS literacy at the middle and high school levels to develop a more diverse, knowledgeable, and globally competitive STEM workforce.
  - ➢ will support partnerships between academia, industry, and others through guest presentations by SOCKS researchers, expert CS teachers, and industry experts, as well as attendance by teachers at CS/AI workshops and conferences.
  - ➢ Over a 10-year period, > 24 teachers certified in CS have the potential to impact 24,000 students in VT (24 teachers x 100 students per year x 10 years).

Future Plans

Education and workforce development:

- Continue to offer CSE course sequence (Fall 2026 - Spring 2028)
- Cohort 1 will complete the CSE Program and be eligible for CS licensure in May 2026
- Continue Cohort 2 recruitment for Fall 2026

Broadening participation:

- Offer CSE courses on an annual basis to a broader audience (in-service and preservice teachers)

Partnerships and collaborations:

- Continue to support partnerships between academia, industry, and professional organizations (CSTA, al Vermont) for future CSE courses through guest presentations by SOCKS researchers, expert CS teachers

Communication and dissemination:

- Present outcomes and findings regarding the SOCKS Teacher
- Academy at regional and national conferences (CSTA, ITiCSE, SiGCSE).

VERMONT EPSCoR

NSF EPSCoR
ADVANCING GEOGRAPHIC DIVERSITY IN STEM