

BUILDING BRIDGES THROUGH TECHNOLOGY

Outreach Programs for K-12 Students

S.M.A.R.T.

Science, Math and
Related Technologies



Northampton Community College

THE PROGRAM

- ✖ Girls in grades 5-8
- ✖ Half-day program
 - + Girls rotate through three hands-on workshops of their choice
 - + STEM focus
 - + Female presenters or Co-ed presenter teams
 - + Parent workshops



WHY S.M.A.R.T.?

- Overcoming gender bias
- Optimal performance of S&E requires diversity
- Demand for domestic workforce capacity in many STEM fields is far exceeding supply



IT'S ALL ABOUT PARTNERSHIPS

- ✘ Volunteer recruitment
 - + College faculty, staff, and students
 - ✘ Participation from multiple institutions
 - + Industry involvement
 - ✘ Presenters
 - ✘ Scholarships
- ✘ Student recruitment
 - + School districts
 - + Community groups



FUNDING

- ✘ Started in 2004
 - + Run twice a year: Fall, Spring
 - + Two locations
 - + Over 200 participants the 1st year
- ✘ Start-up funding
- ✘ Self-sustaining
 - + Volunteers
 - + Program fees

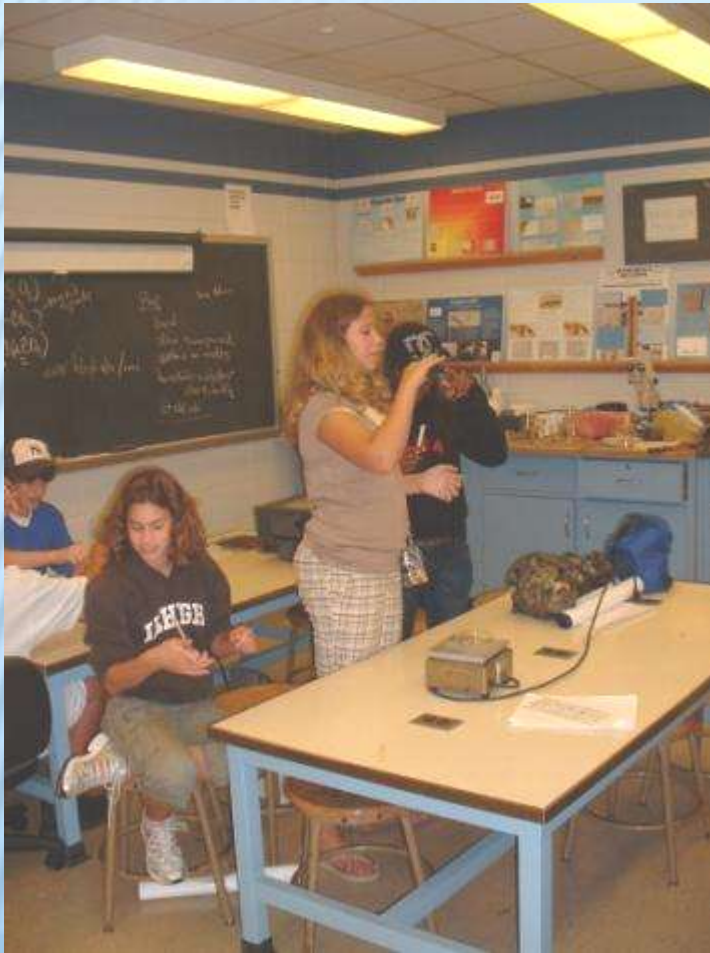


GOALS

- ✖ Inspire girls to continue to pursue their interest in STEM
- ✖ Introduce students to the community college
- ✖ Develop pipeline into STEM majors



BENEFITS



- ✘ Low-cost, fun program for girls
- ✘ Girls have connection to NCC
 - + Girls often participate in other programs
- ✘ Parental awareness
 - + Learn what NCC has to offer (community resource)
 - + Parents encourage other parents to try NCC programs

OTHER OUTREACH PROGRAMS

- ✖ SMaRT Camp (MS)
- ✖ Opto Camp (MS)
- ✖ Explorers (HS)
- ✖ Show Me the Money (MS,HS)
- ✖ Afterschool programs (K-12)
- ✖ School presentations (K-12)
- ✖ Career Days (HS)



MANUFACTURING: THE FUTURE

Southeastern Institute of
Manufacturing and Technology

MANUFACTURING: THE FUTURE



- ✘ First year of program
- ✘ Southeastern Institute of Manufacturing & Technology and Florence-Darlington Technical College
- ✘ Disadvantaged Middle School Students
- ✘ 2 week summer camp for up to 32 students, engaging in a variety of fun, educational, manufacturing related science and math activities
- ✘ Students exposed to and experienced manufacturing technologies such as CAD, CNC Machining, Waterjet Cutting, Rapid Prototyping

MANUFACTURING: THE FUTURE



✘ Reasons for program

- + Expose students to possible career paths in technical fields and manufacturing technologies
- + Educate students on the value of STEM classes, as they relate to a career in manufacturing
- + Allow students to interact with current college students/mentors from their own neighborhoods
- + Recruit potential future students to FDTC

✘ Overall Goal

- + Stimulate student interest in STEM related high school classes

MANUFACTURING: THE FUTURE



✖ Participant Recruitment

- + Students were nominated by school guidance counselor or principal from 3 middle schools
- + Program was free and included breakfast, lunch, all materials, and transportation
- + All students received a backpack full of school supplies

MANUFACTURING: THE FUTURE



✖ Partner Entities

- + Florence School District 1
- + South Carolina Department of Education – EEDA & Personal Pathways Programs
- + Pee Dee Area Boys & Girls Club
- + South Carolina ETV
- + International Knife and Saw Inc.
- + Progress Energy
- + Angus-Palm Inc.

MANUFACTURING: THE FUTURE



✘ Program Staffing

- + Hired Program Director – paid temp position
- + College student mentors -3 with STEM majors – paid
- + FDTC & SiMT Staff – several volunteers

✘ Funding Sources

- + City of Florence - \$5,000
- + United Way - \$10,000
- + Florence Rotary Club - \$3,000
- + ESAB Cutting & Welding - \$3,000
- + SC Dept of Ed – School Supplies

MANUFACTURING: THE FUTURE



× Keys to success

- + Let kids do hands-on activities (avoid boredom)
- + Company representatives spoke and did demonstrations to students (next year do plant visits)
- + Exposure to technologies located in the SiMT facility
- + Last day graduation ceremony that included parents (they need to be involved in students education)
- + Performed before and after student survey
 - × measure students' knowledge of regional manufacturing's application of technology
 - × what careers were available
 - × Students' interest in STEM careers

FIRST LEGO LEAGUE

- ✘ South Carolina Regional FLL Tournament –
Winners advance to SC State Tournament
- ✘ Second year of program
- ✘ Southeastern Institute of Manufacturing & Technology and
Florence-Darlington Technical College
- ✘ Grade school, middle school, junior high students
- ✘ Global program utilizes theme-based Challenges to engage kids
in research, problem solving, and engineering

FIRST LEGO LEAGUE

✖ Reasons for Program

- + Created to get kids excited about science and technology (STEM)
- + Expose students to possible career paths in technical fields
- + Recruit potential future students to FDTC

✖ Overall Goal

- + Stimulate student interest in STEM related high school classes

FIRST LEGO LEAGUE

× Participant Recruitment

- + Anyone can form a team. It can be a school classroom, after-school program, extracurricular group, home school, neighborhood kids, a club, or civic organization
- + Registration is done through the National FLL website, then the SC State FLL regional website
- + Teams purchase LEGO robot kits, pay national registration, regional registration, misc items – total cost ~\$700 first year, \$400 recurring years

FIRST LEGO LEAGUE

✘ Partner Entities

- + Multiple school districts
- + Clemson University
- + AT&T (Bellsouth Pioneers)

✘ Program Staffing

- + FDTC & SiMT Staff – volunteers
- + AT&T (Bellsouth Pioneers) – volunteers
- + FIRST Robotics Team 1051 – High School Student volunteers

✘ Cost to College ~ minimal

FIRST LEGO LEAGUE

✖ Keys to Success

- + Lets kids do fun hands-on activities involving robotic technology
- + Competition atmosphere creates excitement about STEM
- + Kids learn to work in teams
- + Volunteers make it work



North Orange County Community College District
Center for Applied Competitive Technologies
California Community Colleges

SB70 QUICK START TECHNOW4U ADVANCED MANUFACTURING HIGH SCHOOL ACADEMIES



**ECONOMIC &
WORKFORCE
DEVELOPMENT**
through the
CALIFORNIA
COMMUNITY
COLLEGES



THE ACADEMIES

- ✘ A “hands-on” career pathway exploration Saturday Academy Program
- ✘ Los Angeles and Orange County High School Students—Grades 9 through 12
- ✘ Conducted 18 Academies during Fall and Spring Semesters 2006-2008
- ✘ Academy hours 9:00 a.m. to 2:00 p.m. on five consecutive Saturdays
- ✘ Academy instructors used hands-on, “project-based” instruction
- ✘ State-of-the-art technology, including rapid prototyping equipment, was secured and integrated into each of academies’ activities



THE SB70 QUICK START COLLABORATIVE

✘ Community Colleges

- + Fullerton College
 - + Cerritos College
 - + East Los Angeles College
 - + Long Beach City College
- CNC/ISO Quality Academy
 - Composites/Materials Design Academy
 - Engineering Academy
 - Architectural Design Academy

✘ High Schools

- + High Schools: **Winter/Rosie the Riveter Charter School** (Engineering and Construction Trades), Troy, Don Bosco, Sonora, Western, Esperanza, El Dorado, Anaheim, Paramount, Bell Gardens, Woodrow Wilson, Elizabeth Learning Center, Bell, La Mirada, Bell (Track A and C), Norwalk, Bellflower, Maywood Academy, Millikan, Alhambra, John C. Fremont, Schurr, Garfield, Cabrillo, Roosevelt, Lincoln, Montebello, Mayfair, John Glen, El Monte, Lynwood, Fullerton, Valencia, Sunny Hills, Jordan ACE (Architecture, Construction, and Engineering), Woodrow Wilson (LBUSD), Avalon, CAMS, Lakewood, Trabuco Hills, High School, Inc., Katella, Brea Olinda, Lorin Grisette Academy, and Renaissance

✘ Partners

- + ROCPs
- + Tech Prep Consortia
- + Centers for Applied Competitive Technologies
- + Industry Partners



PROGRAM ACCOMPLISHMENTS AND LESSONS LEARNED

× Accomplishments

- + Established a uniquely cohesive and effective regional partnership
- + Ties to business and industry were strengthened
- + High school students introduced to careers in manufacturing and related technology fields
- + Female students comprised 50 percent of Academy enrollments
- + Heightened awareness of administrators, faculty, counselors and parents that manufacturing remains an important and viable segment of the local economy, offering a wide range of jobs.
- + New articulation agreements were developed, updated and renewed.
- + State-of-the-art technology was secured and integrated into each of academies' activities

× Lessons learned

- + High school students, given the opportunity, enjoy hands-on projects and experiential learning environments.
- + Affirmed for college administrators the value of CTE programs
- + Courses in manufacturing are of value to non-college bound students and to students whose career goals include four-year degrees in engineering, design and architecture



PROGRAM FUNDING CALIFORNIA SENATE BILL 70

- ✘ SB70 provided 52 million dollars for Career Technical Education
- ✘ Funding was distributed through the California Community Colleges Chancellor's Office—Economic and Workforce Development Program
- ✘ Funding provided for improving existing career pathways in manufacturing, engineering and other technologies
- ✘ Quick Start projects funded for two-year terms (2006-2008), for a maximum of \$450,000
- ✘ Centers for Applied Competitive Technologies were encouraged to take a leadership role



MARKETING AND RECRUITMENT

× Staffing

- + Fiscal Agent—NOCCCD CACT Director, Marketing/Outreach Coordinator
- + Community Colleges—Faculty, Tech Prep Coordinators, CACT Directors

× Marketing and Recruitment Materials

- + Printed outreach and marketing materials, which prominently display the EWDP and CACT logos, along with the SB 70 Quick Start TechNow4U logo and those of the participating colleges.
- + A TechNow4U website (www.technow4u.com)
- + T-Shirts for college faculty, staff and academy students with imprinted project brand name; “SB70 TechNow4U”
- + Other “branded” promotional items such as tote bags for staff and faculty operating the project



Outreach Programs for K-12 Students

Building Bridges with Technology

Erich J. Spengler

Center for Systems Security and Information Assurance
at Moraine Valley Community College

Referenced Programs

- **CSSIA GirlTech**
- **CSSIA Geek-U**
- **Other CSSIA / CORD Partnerships**



CSSIA and K-12 Outreach Programs

- **GirlTech**

 - Madison Area Technical College

 - Moraine Valley Community College

- **Geek University (Geek-U)**

 - Inver Hills Community College

- **Technology Fridays and LAN101**

 - Moraine Valley Community College

- **Community Computer Health Fair**

 - Moraine Valley Community College

- **We are IT (Sponsor-Ohio)**

 - Rhodes State College

 - Owens Community College

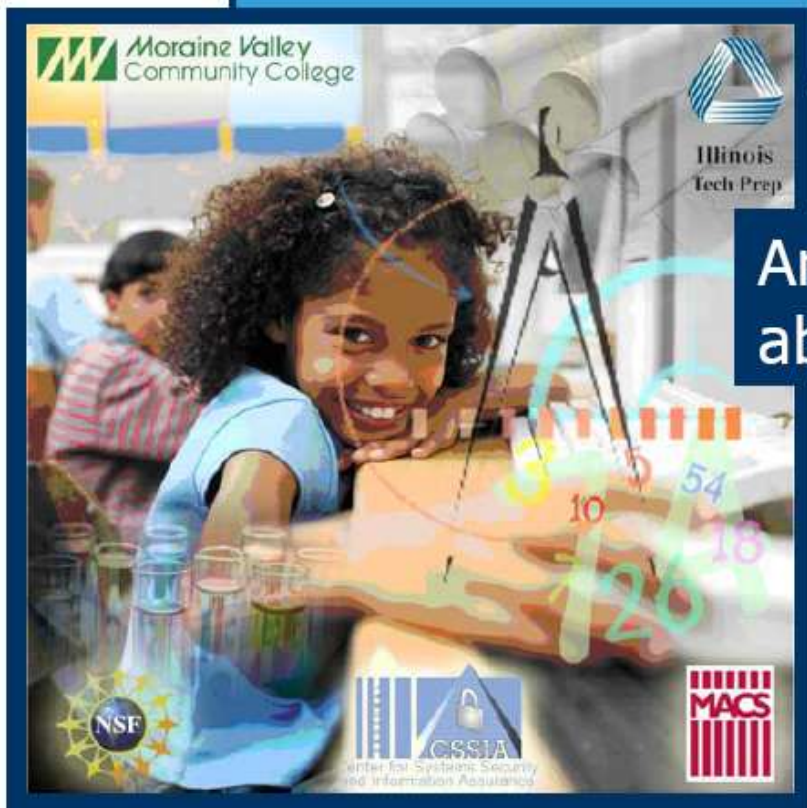


Target Audiences - GirlTech

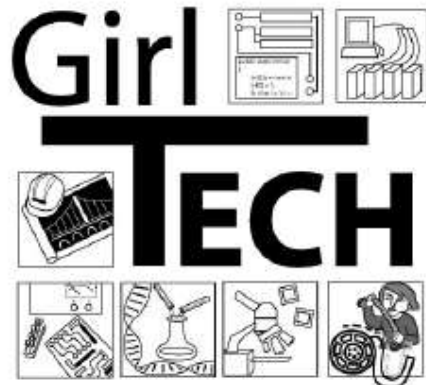
Girl Tech Summer Camp

Are you starting to think about your future career?

- FOR:** Girls, Incoming Grades 6th – 9th
- WHEN:** July 16, 17, 18
- TIME:** 8:30 – 3:15pm (Lunch provided)
- WHERE:** Moraine Valley Community College
9000 W. College Parkway
Palos Hills, IL 60465-0937
- COST:** Free



Focus and Format - GirlTech



Girls Tech Summer Camp

FOR: Girls, Incoming Grades 6th – 9th

WHEN: July 16, 17, 18



Time	Wednesday, July 16		Thursday, July 17		Friday, July 18	
8:30-9:00 am	Registration/check in					
9:00-11:30 am	Wireless	G1	Wireless	G3	Wireless	G5
	Animation	G2	Animation	G4	Animation	G6
	Welding	G3	Welding	G5	Welding	G1
	Robotics	G4	Robotics	G6	Robotics	G2
	Law Enforcement	G5	Law Enforcement	G1	Law Enforcement	G3
	Auto Mechanics	G6	Auto Mechanics	G2	Auto Mechanics	G4
11:30-12:30 pm	Lunch – Café Moraine (food vouchers) and/or pizza					
12:30-3:00 pm	Wireless	G2	Wireless	G4	Wireless	G6
	Animation	G3	Animation	G5	Animation	G1
	Welding	G4	Welding	G6	Welding	G2
	Robotics	G5	Robotics	G1	Robotics	G3
	Law Enforcement	G6	Law Enforcement	G2	Law Enforcement	G4
	Auto Mechanics	G1	Auto Mechanics	G3	Auto Mechanics	G5

Target Audiences – Geek University

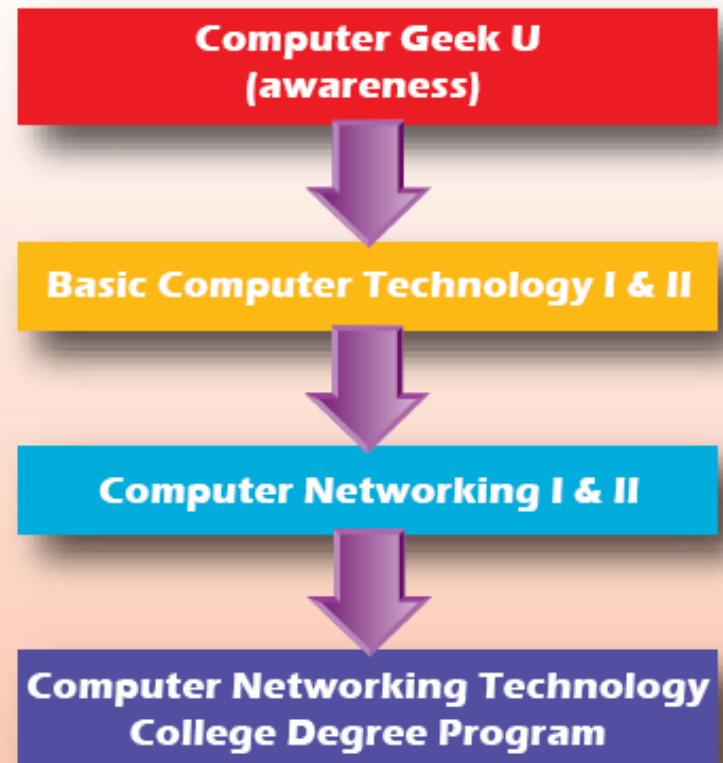
Program Overview

High school students have grown up surrounded by computers. This has created a growing interest and desire of students to know more about how computers work. Some students want to just learn more about computers at a hobby level. Others are interested in possible careers in Computer Technology. According to U.S. Bureau of Labor Statistics, this occupational group is expected to grow by 134% between 2002 and 2012.

At this time there are few class opportunities for high school students to enroll in. Providing computer technology classes in the high school can be a challenge for school administration. High equipment costs, finding qualified instructors, and lack of time in the students daily class schedule all make it difficult to offer computer technology classes during the school day.

In some high schools computer clubs have been organized by interested students and parents. These students meet after school and on weekends to share and expand their knowledge and excitement in this field.

This new program is designed to meet these challenges by utilizing college resources of equipment, classroom/labs and qualified instructors. This new program also makes the classes convenient to the high school student's daily schedule.



Focus and Format – Geek-U

Courses

■ Computer Geek U (awareness)

This course provides an excellent introduction to the IT industry and interactive exposure to personal computers, hardware, and operating systems. Individuals participate in hands-on activities and lab-based learning to become familiar with various hardware and software components and discover best practices in maintenance and safety.

4 days 9:00AM – 3:00PM(Monday – Thursday)

■ Basic Computer Technology I

The PC Hardware and Software Course provide a comprehensive over-view of computer fundamentals and an introduction to advanced concepts. It allows individuals to gain practical knowledge on how a computer works. Individuals who complete this course will be able to describe the internal components of a computer, assemble a computer system, install an operating system, and troubleshoot using system tools and diagnostic software. They will also be able to connect computers to the internet and share resources in a networked environment.

Chapters 1-10 cover the following skills and competencies

Core competencies in the latest hardware and software technologies information security skills

Safety and environmental issues

Soft skills for career development

35 hours Two days per week 3:30 – 5:30PM 8 weeks

■ Basic Computer Technology II

The PC Hardware and Software Course will help individuals prepare for entry –level IT positions within various environments. It will also help individuals develop greater skills and confidence in working with desktop and laptop computers. In addition, PC Hardware and Software covers the following new topics: Laptops and portable devices, wireless connectivity, security, safety and environmental issues and communication skills.

Chapters 11-16 cover the following skills and competencies

Advanced troubleshooting skills

Prepare for all three CompTIA job environments certification exams

Advanced installation of computers, peripheral devices, networks and security components

35 hours Two days per week 3:30 – 5:30PM 8 weeks

Additional Information - GirlTech

- **Key reasons for initiating program?**

 - Career Pathways Opportunities**

 - Gender Equity Opportunities**

- **Partnerships**

 - Local College and Community Support**

 - Grants**

 - Corporate Support**

 - Volunteers**

 - Corporate Entities**

 - College Foundation**

Additional Information - GirlTech

- **Program Staffing**

Local College Faculty

College Student Leadership

High School Leadership

CSSIA Administrative Resources

College Recruiting and Advising

Parents and Guardians

Community and Industry Leaders



Additional Information - GirlTech

• Program Marketing/Recruitment Website



The screenshot shows a web browser window titled "Girls Tech Summer Camp - Windows Internet Explorer". The address bar displays "http://www.cssia.org/girlstech/". The browser's menu bar includes "File", "Edit", "View", "Favorites", "Tools", and "Help". A search bar contains "Girls Tech Summer Camp". The website content features a large banner with the text "GIRL TECH SUMMER CAMP" and a grid of icons representing various technical fields. Below the banner is a navigation menu with links for "REGISTRATION", "SESSIONS", "SPONSORS", and "HOME". A main content area includes a photograph of a young girl working with a computer, followed by a promotional text block and a list of details for the camp. At the bottom, there is contact information and the Moraine Valley Community College logo.

GIRL TECH SUMMER CAMP

REGISTRATION | SESSIONS | SPONSORS | HOME

Are you starting to think about your future career?

Come join us for a fun-filled three days. Participate in hands-on activities lead by professionals.

FOR: Girls, Incoming Grades 6th - 9th
WHEN: July 16, 17, 18
TIME: 8:30 - 3:15pm (Lunch provided)
WHERE: Moraine Valley Community College
9000 W. College Parkway
Palos Hills, IL 60465-0937
COST: Free
[Download Brochure/Application](#)

Session available in Animation, Auto Mechanics, Computer Networking, Law Enforcement, Robotics and Welding. LIMITED SEATING. FIRST COME, FIRST SERVE.
Application deadline - July 1st 2008

Want more information?
Contact: Debbie Wills
Phone: (708) 974-5759
Email: WillsD6@morainevalley.edu

 Moraine Valley Community College

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Additional Information - **GirlTech**

- **Number of Years in Existence**

3 Years @ MATC and 1 Year @ MVCC

- **Funding Source**

Grants (CSSIA/NSF), Corporate, Local

- **Overall Goals**

Recruitment and Career Pathways Initiation

Gender Equity within Non – Traditional Careers

**Future Emphasis on STEM and Career
Program Collaboration and Integration**

Additional Information - GirlTech

- **Keys to Program's Success**

 - Needs a Champion**

- **Benefits to College and Participants**

 - Increased female enrollments in non-traditional career choices**

 - Community satisfaction and college awareness**

 - Cross subdivision and administration collaboration**

 - Hands-on career opportunity exposure at early ages**

 - Many others**

Your Next Step - GirlTech

- **Full Implementation ToolKit Available**

Girls Tech Camp Toolkit



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RESOURCE LIST

- ✘ <http://firstlegoleague.org/community/fll/welcome.aspx>
- ✘ <http://www.technow4u.com>
- ✘ <http://www.cssia.org/girlstech>
- ✘ <http://www.genderequitycollaborative.org>
- ✘ <http://www.stemtransitions.org>

PANEL MEMBERS

- ✘ SMART Program
Barb Canfield
Northhampton CC
BCanfield@northhampton.edu
- ✘ TECHNOW4U Academies
Norma Alvarado
North Orange CC District
nalvarado@sce.cc.ca.us
- ✘ Manufacturing: The Future
Jack Roach, SiMT
Jack.Roach@fdtc.edu
- ✘ GirlTech and GeekU
Erich Spengler
Moraine Valley CC and CCSIA
Spengler@morainevalley.edu
- ✘ Collaborative for Gender Equity
and STEM Transitions
Hope Cotner, CORD
hcotner@cord.org