

First Bytes: Preparing K-12 Educators for CS Inclusion

Melissa C. Stange

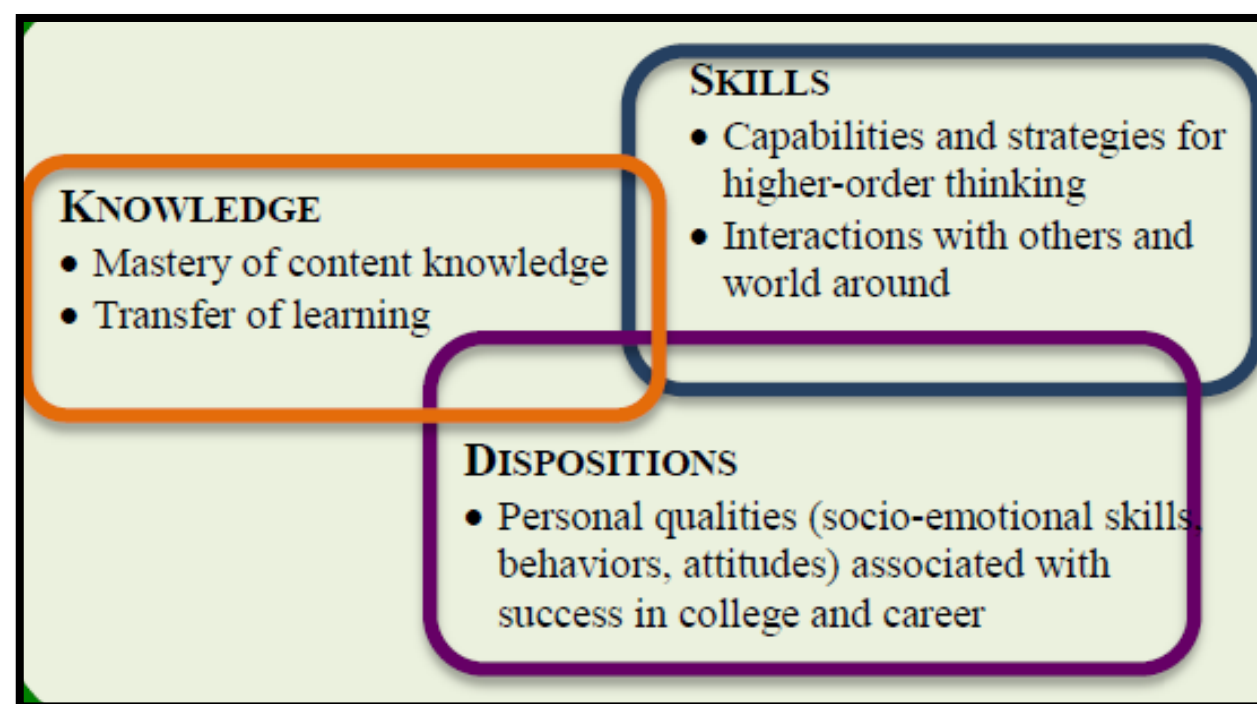
Lord Fairfax Community College

Background

In 2016, Former U.S. President Obama started a Computer Science For All initiative [1] and in Europe it is the Informatics For All initiative [2]. In 2020, many school systems are still trying to figure out how to meet the learning requirements of bringing Computer Science (CS) into every primary and secondary classroom. As state department of education offices throughout the United States are trying to support the initiative and have started adding CS requirements to standardized testing, the lack of *professional development (PD) for educators has been forgotten*.

Goal

Competencies = Knowledge + Skills + Dispositions



Method 1

Year long community of practice with weekend hands-on

- Public School District 1 - 178
- Public School District 2 - 565
- Public School District 3 - 268
- Public School District 4 - 155



Learning Outcomes:

1. Examine the field of Computer Science
2. Examine 5 Core Exploring Computer Science areas
3. Create lessons that integrates CS Competencies
4. Reflect & Share Community of Practice tool
5. Discuss how issues of access, instructional practices, assessments, and culturally relevant curriculum impact student participation and success
6. Serve as a CS mentor to other educators
7. Locate resources for K-12 CS curriculum
8. Connect 7 Big Ideas of CS to the local community

Method 2

Year long mentoring to build CS clubs & educator skills

- 20 School Partners
- 22 Clubs Created
- 27 Educators Mentored
- 435 Students Reached



Goal:

Teach CS Competencies through real-time use with students through clubs

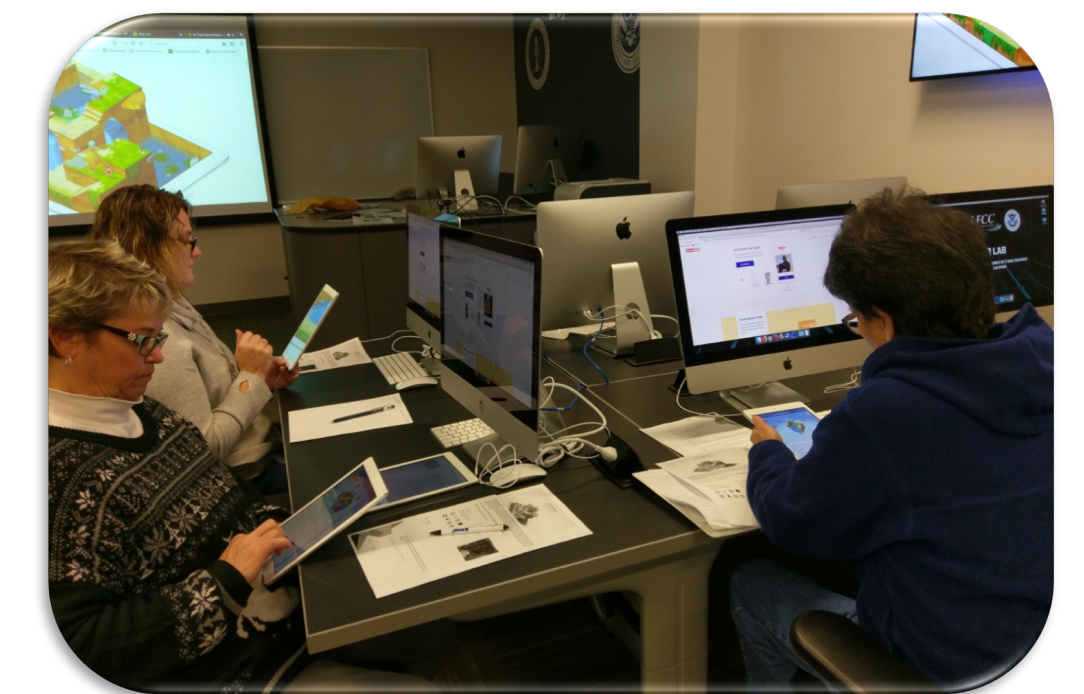
Club Topics:

- Programming
- Cybersecurity
- Robotics
- Electronics
- Graphics
- Gamification
- Computer Math
- Team work
- Problem Solving
- Computational Thinking
- CS Research & Information Literacy

Method 3

Year long undergraduate CS licensure program

- 17 School Partners
- 23 Educator Students
- 18 Undergraduate Credits
- CS Add-on Licensure



Learning Outcomes:

1. Examine the field of Computer Science
2. Apply CS Concepts to solve problems
3. Evaluate systems to realistic constraints
4. Practice ethical and legal responsibilities
5. Function effectively on teams projects
6. Analyze local & global CS impact
7. Demonstrate effective communication with a range of audiences
8. Apply design and development principles in the construction of software systems of varying complexity
9. Demonstrate ability to write in a scholarly journal format on a technical topic
10. Apply CS concepts and algorithmic principles to models of computer systems showing comprehension of the tradeoffs