



## The 10th Annual WPU Educational Technology Conference

### Supporting the Development of Computational Thinking Skills for All Learners

Friday, November 15th, 2019  
8:30 AM - 3:10 PM  
William Paterson University  
1600 Valley Road, Wayne, NJ 07470

In our ever-evolving technological world, supporting students' development of computational thinking at an early age is critical. This year's conference addresses key aspects of computational thinking and how this skill-set can be fostered in preK-12 classrooms. Conference participants will gain knowledge and competencies for integrating computational thinking and coding activities into their preK-12 classrooms.

*Program Chairs: Dr. Heejung An & Dr. Pei-Lin Weng*

**8:30 am – 9:00 am: Registration, Breakfast**

**9:00 am – 10:20 am: Concurrent Session I**

- **Beyond Coding: Applying Computational Thinking through Making**  
*By Dr. Diallo Sessoms, Salisbury University*

*Target audience: Elementary school teachers*

Computational thinking is a set of skills that can be used across a variety of disciplines and has a growing presence in classroom as teachers integrate technology. Many educators already teach skills associated with computational thinking. In this learning experience, participants will identify where computational thinking already exists in their teaching and explore the components of computational thinking. *Making* is fundamental to makerspaces and is a convenient venue to explore computational thinking. Using maker activities, participants will create while using computational thinking skills and expand. The

convergence of computational thinking and makerspaces will inspire participants to start *making* with computational thinking in their classrooms. The concepts in this learning experience can be modified and scaled for any level of K-12.

- **Introduction to AI Robot Programming with Calypso**

*By Dr. David Touretzky, Carnegie Mellon University;  
Jason Huang, ReadyAI Inc.;*  
*Dr. Amy Eguchi, University of California San Diego*

*Target audience: 3-12 grade teachers*

Calypso is an intelligent robot programming framework for the Cozmo robot by Anki. Calypso gives students hands-on experience with real artificial intelligence tools, including computer vision (object recognition, face recognition, and emotion detection), speech recognition and generation, path planning, object manipulation, and landmark-based navigation. Calypso's pattern matching rule-based formalism offers a different take on computation than procedural languages such as Scratch or Python. This workshop will introduce attendees to Calypso and the Cozmo robot and show how teaching the "Laws of Calypso" can help students learn to reason about programs. Prior robotics experience is not required.

- **Introducing Computational Thinking with Dash and Dot**

*By Denise Post and Melissa VanWingerden, New Providence School District*

*Target audience: K-3 grade teachers*

In this workshop, teachers will get an introduction to Wonder Workshop's Blockly App and Dash & Dot Robots. Participants will experience lessons that will teach students algorithmic design, pattern recognition, and how to decompose a problem in order to find a solution. The lessons are based on Wonder Workshop's 2015 coding challenge where students will send Dash into outer space. This challenge has been adapted to fit the abilities of students who have just begun learning to code.

- **Computational Thinking with Drones**

*By Amy Mercado, Unity Charter School*

*Target audience: K-8 grade teachers*

Manipulatives are commonly used with young learners to help them explore computational thinking in concrete ways. Drones can be an important manipulative for K-8 classroom settings. Participants will use BeeBots and Sphero Drones to explore coding, computational thinking and developmentally appropriate practice.

- **Code.org and Computational Thinking**

*By Dr. Steven Lahullier, Technology Teacher, Robert Gordon School*

*Target audience: Upper level elementary school teachers*

This workshop will demonstrate the effectiveness of the code.org curriculum at improving computational thinking skills among fifth-grade students. The effectiveness was

determined by a study conducted in the Fall of 2018 in a suburban public school district in New Jersey. Quantitative and qualitative results relating to the effectiveness of code.org will be discussed. Recommendations will be provided for teachers to bring back to their schools for measuring computational thinking skills and suggesting appropriate curricular options for improving computational thinking skills among students.

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### 10:20 am – 10:25 am: Break

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### 10:25 am – 10:30 am: Introductory Remarks (Valley Auditorium)

*Dr. Amy Ginsberg, Dean, College of Education, William Paterson University*

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### 10:30 am – 11:45 am: Keynote Address (Valley Auditorium)

*By Mr. Joshua Koen, Executive Director for Educational Technology & Computer Science, Office of Teaching & Learning, Newark Board of Education*

#### ***Scaling a Computer Science Education in a Large School District***



The Newark School District is the largest and one of the oldest school systems in New Jersey with 66 schools, 5,595 employees and a student population of 35,329. Its origin dates back to 1676 and Barringer High School, in Newark's North Ward, is the third oldest public high school in the nation. In addition to the incredible importance of reading and writing as a foundation for educational success, we've developed a plan to provide all students over the next few years with a computer science education beginning in kindergarten and ending with a sequence of rigorous courses in high school. Mr. Koen will share the evolution of this strategy and the strategic partnerships that

have been established to help achieve this goal.

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### 11:45 pm – 12:25 pm: Lunch

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### 12:25 pm – 1:45 pm: Concurrent Session II

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- **Taking it to the Next Level: Using Cue to Advance Computational Skills**

*By Denise Post and Melissa VanWingerden, New Providence School District*

*Target audience: 4–8 grade teachers*

Do your students love Dash but are ready for more of a challenge? Join us in meeting Cue and learning what he is capable of. In this workshop, teachers will participate in a lesson

in which they will use Wonder Workshop's Cue App and Robot to create variables and functions that direct Cue to draw complex geometric shapes.

- **Supporting Development of Computational Thinking with Coding in Scratch**

*By Dr. Heejung An, William Paterson University*

*Target audience: 3–8 grade teachers*

In this workshop, participants will be introduced to several ways in which computational thinking can be taught while coding in the Scratch environment. Participants will first learn how to break down a big problem into smaller sub-problems and to arrange them in an appropriate sequence. Before using Scratch, participants will explain, in their own words, what steps are needed to perform a task.

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- **Beyond Coding: Applying Computational Thinking through Making**

*By Dr. Diallo Sessoms, Salisbury University*

*Target audience: Elementary school teachers*

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- **Teaching Computational Thinking Skills for Pre-K Children**

*By Dr. Pei-Lin Weng, William Paterson University*

*Target audience: Pre–K teachers*

Computational thinking involves analyzing problems and expressing solutions that can be understood by a computer. Computational thinking is fundamental to coding and should be fostered from a young age. In this workshop, we will introduce the four pillars of computational thinking: (a) decomposition, (b) pattern recognition, (c) data representation and abstraction, and (d) algorithms. Participants will practice creating age-appropriate activities/games that promote the development of these four computational thinking skills for preschool and kindergarten children. We will also discuss how to assess and select commercially available coding products/games for young children.

**1:45 pm – 1:50 pm: Break**

**1:50 pm – 3:10 pm: Concurrent Session III**

- **Computational Thinking with Drones**

*By Amy Mercado, Unity Charter School*

*Target audience: K–8 grade teachers*

Manipulatives are commonly used with young learners to help them explore computational thinking in concrete ways. Drones can be an important manipulative for K-8 classroom settings. Participants will use BeeBots and Sphero Drones to explore coding, computational thinking and developmentally appropriate practice.

- **A Deeper Look at Calypso**

*By Dr. David Touretzky, Carnegie Mellon University;*

*Jason Huang, ReadyAI Inc.;*

*Dr. Amy Eguchi, University of California San Diego*

*Target audience: Anyone who took the Introduction to AI Robot Programming with Calypso™*

This workshop is a sequel to "Introduction to AI Robot Programming with Calypso" in which we'll delve deeper into the Calypso language and how it helps teach computational thinking. We'll cover the Calypso idiom catalog, the relationship between the Laws of Calypso and the idioms, subtleties of the Fourth Law and the "and then..." operator, how Calypso helps students learn state machine programming, and use of the map layout editor to design robot environments.

▪ **Code.org and Computational Thinking**

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- Participants will receive 6.5 Professional Development Hours
- Fee: \$99
- Contact information: Alma Diaz, [diaz6@wpunj.edu](mailto:diaz6@wpunj.edu)
- Registration: <https://wpconnect.wpunj.edu/continuing-education/Education/>