



Computational Thinking:

A Foundation for Computer Science

Interim Evaluation Report – February 4th, 2019

AESD ASSOCIATION OF
EDUCATIONAL
SERVICE DISTRICTS

Nine ESDs. One Network.
Supporting Washington's Schools and Communities.

Computational Thinking: A Foundation for Computer Science

I. Introduction

Computational Thinking: A Foundation for Computer Science is a statewide initiative awarded to the Association of Education Service Districts (AESD) and funded by the Office of Superintendent of Public Instruction (OSPI). The work is focused on advancing equitable access to computer science education to teachers and students throughout the state of Washington. This strategic alliance between the nine Education Service Districts (ESDs) has promoted and cultivated a communicative process of fostering and sharing expertise, resources, and data collection.

The program objectives are facilitated by three statewide convenings of regional ESD Computer Science (CS) Leaders with key OSPI staff to discuss regional and statewide efforts/partnerships and how best to form a “leadership” Professional Learning Community (PLC) within their regions. Each ESD will host several CS leadership meetings in their region to bring together partners and vendors that provide resources to support CS and computational thinking. The outcomes will include connecting high quality professional learning and resources while leveraging existing and future partnerships to grow educator knowledge and practice, leadership and educator capacity. The ESDs will work to find ways to create new partnerships, support and expand work, facilitate district level participation through strategic planning and implementation and focus on areas of K-5 integration of CS and computational thinking.

ESD 113 has been designated as the fiscal agent for the grant as well as acting Project Coordinator. The Project Coordinator responsibilities include: (1) convening the ESDs on a regular basis; (2) providing regular project updates and continued communication; (3) serving as liaison between AESD, individual ESDs, OSPI, and partners; and (4) serving as a statewide representative on behalf of the AESD network.

This is the second of three evaluation reports to OSPI that will summarize the activities and outcomes of the work. This interim report consists of four sections: 1) introduction, 2) program activities, 3) progress toward measurable objectives, and 4) next steps.

II. Program Activities

This section reports on the various program activities that have been implemented as well as activities that are planned to occur before August 2019. The timeline below provides a high-level look at the status of the major activities (Table 1). Next, the Professional Learning Community (PLC) Network schedule, outcomes and status are presented (Table 2). Lastly, the Computer Science Lead at each ESD provided a narrative describing their completed and upcoming tasks as well as items of significance for their site.

Table 1. Timeline and progress of work plan tasks.

Time Frame	Work Plan Tasks	Responsible	Status
May-July 2018	Designate AESD CS leadership for each ESD; Coordinate AESD leadership meeting dates, agendas, and outcomes	CSE Superintendent or designee; ESD 113 Program Coordinator	Completed
July-Aug 2018	Develop Communication Plan	Program Coordinator	Completed
Sept 2018 to June 2019	Region hosts 3 CS leadership PLCs	AESD CS Leaders	1 of 3 completed
Oct 2018 to June 2019	Expand Collaborative Partnerships	AESD CS Leaders	Ongoing
Oct 2018 to Aug 2019	Deliver Professional Learning	AESD CS Leaders Support Districts Collaborating Partners	Ongoing professional learning with districts. WA. CS Leadership PLC Network facilitation. SCRIPT opportunities for districts. Connecting partnerships to districts for ongoing PL and support.

Washington Computer Science Leadership PLC Network Schedule and Goals

Three statewide Computer Science PLCs will enable the ESDs to: 1) develop a statewide mission, vision, and pathway encouraging computer science for ALL; 2) understand the need and developing capacity for leadership around computer science; 3) develop and support resources that promote Building Equity for CS; 4) understand computational thinking as a pillar of computer science and begin implementing the computer science standards in practice and; 5) find ways to see effective computer science education and provide leaders opportunities to understand their journey. The PLC event date, outcomes and status are presented below in Table 2.

Table 2. PLC event schedule, overall outcomes and status.

PLC Event Date	PLC Overall Outcomes	Status
CS PLC Day #1 November 19, 2018	Overall Outcomes: Introduction to Statewide Outcomes for Computer Science and create outcomes for PLC. Support participants' growth into CS Leadership. Introduction Computational Thinking and the Computer Science Standards.	Completed
CS PLC Day # 2 February 6 th , 2019	1. Continue supporting statewide CS Outcomes. 2. Growing CS Leadership. 3. Connecting to the Computer Science Standards through Integration. 4. Seeing Vertical Integration and Practice that promote equity. 5. Continuing collaboration and Connectivity.	Planned and upcoming soon
CS PLC Day # 3 April 24 th , 2019	TBD after CS PLC Day #2	Planning will begin the week of February 11 th , 2019

ESD Activities and Tasks Completed

The Computer Science Lead at each ESD offered the following summaries about the exciting activities taking place and networks that are coming to fruition as a result of this work. Please note that this is a brief summary and does not encompass all the work happening in the regions.

NEW ESD101. *We had a CS kick off last August which included CS Discoveries for the Middle School teachers and CS Principles for High School Teachers. We are currently hosting both of these groups and did a week-long workshop in August with four follow up weekend trainings running through February. We have held 12 CS Fundamental trainings in districts as well as doing Ozobot and Sphero trainings. We are doing VR and AR trainings with 10 districts working on tech implementation at varying levels.*

We have done 3 SCRIPT trainings with districts and are working on a landscape analysis of what every one of our 288 schools need to feel supported with CS. We are working on 2 major NSF +C grants that incorporate STEM, which will include CS PD for all of our districts and create collaboratives in our various regions.

We convene technology teachers bi-monthly to communicate with technology teachers and district directors about all the opportunities in our region. We have a monthly meeting with CTE directors in our region in order to communicate wants/needs/happenings around high school computer science programs. Our CSTA group has a new president, Adam Smith, and convenes once a month in order to plan programs and events.

The largest event we have coming is a Hackathon in February that will include high school and middle school students in the region. The CS Lead has been asked to do two TEDx talks around game-based learning, which we are incorporating into the trainings in our region. We have been granted funding to attend the National CSTA in order to collaborate with CSTA leadership around the nation. We are presenting our computer science implementation plans at three conferences this year.

ESD 105. *Our first CS Leads Team meeting on November 20 was attended by 24 teachers, technology coaches and administrators, remarkable for being just 2 days before Thanksgiving! Following the event, ESD 105 established an ESD 105 CS Leads 'Steering Committee' to help direct the work related to computer science in our region. This committed group of CS advocates crafted an objective statement that will guide and focus future efforts to grow computer science integration in our*

region. The Steering Committee will also be crafting surveys for K-5, 6-8 & 9-12 to assist the CS Leads Team in determining our region's current CS landscape and assist in determining and prioritizing support efforts.

A series of computer science-based professional development events are scheduled across the next 4 months involving trainings for Code.org, CS Launch (Computational Thinking Integration), STEM Robotics 101 & Introductory Drones for STEAM & CS. In addition, we are working with two national entities, TECHNOLOchicas & Girls Who Code, to help expand opportunities for girls to learn about and participate in computer science.

ESD 105 is supporting two significant student competitions: a FIRST Robotics Challenge regional competition is scheduled for March 15-16 at the Yakima Sundome. Also, ESD 105 has been selected to be involved in NASA's 'Apollo Next Giant Leap Student Challenge (ANGLeS Challenge). A local student programming challenge is being planned for May 18 at Toppenish School District. ESD 105 is moving forward with an application to start a CSTA Regional Chapter. We are excited about the additional exposure this designation will bring for our students, schools & communities.

ESD 112. *Our CS PLC is 14 members strong at the moment, and all of our districts are in very different places with implementation/support of CS efforts at all levels. We're focusing on helping our teacher leaders increase their own skills, spread the word about how CS is easily integrated into other subjects, and brainstorming how to help guide their districts toward a more uniform implementation of CS standards across the board. We have started a book study with half our members using the No Fear Coding book and half using the Computational Thinking book.*

Capital Region ESD 113. *At Capital Region ESD we have participated in the statewide CS PLC day. This work included an invitation for all ESDs across Washington to participate in foundational work of CS and Computational Thinking. This meeting led to our region having support for each district that wanted to get*

involved and we have since had these leaders present that work to their district. We are being invited to each participating district and working with them to develop a plan to have a deeper investment into CS practices. Computational thinking and strategies are where they are now focusing. Another success was working with Districts for their CS Week. We were invited and toured multiple districts and highlighted their successes.

Olympic ESD 114. *We offered our Computer Science Professional Learning Community (PLC) at Port Angeles, a regionally-centered location, on November 20; the statewide Computer Science PLC day. Districts were invited to participate but were unable to attend. One of the challenges is many of our small/rural/remote districts depend on the same people for multiple different central office tasks and these people are pulled in many directions. Another challenge for participation is many of these same districts participate in another computer science grant awarded by OSPI to one of our school districts as part of a STEM network.*

OESD 114 has provided additional computer science opportunities during the 2018-2019 school year through Edison Robot workshops and lending program, code.org trainings, computer science tied into NASA workshops, and through discussions at regional assistant superintendent meetings. We will continue to provide these trainings and venues for discussion, as well as advertise and attempt to recruit for the statewide computer science convenings.

PSESD 121. *Our CS supports exist on two levels. First, we are supporting CS district leadership through our CS regional meetings - a time for CS leaders in our region to grow and learn together. Secondly, we support teachers in our region through CODE workshops at the elementary, middle and HS levels. We also support teachers outside our region as CODE's western Washington lead.*

ESD 123. *In the Othello School District, Computer Science is gaining more interest and attention every year. For the past few years our middle school has offered a coding and robotics electives and we also now have a CTE class for 7th and 8th graders that focuses on Engineering, but also teaching computer aided design.*

The 2018-19 school year has seen the most forward movement in our Computer Science efforts. All 6th graders have the opportunity to take an elective on building and coding a computer with Raspberry Pi and Piper Kits. Teachers have been taking numerous district workshops to introduce them to Raspberry Pi, Microbit, HyperDuino, and 3D printing. All of these workshops put an emphasis on computational thinking and the various coding languages, 21st Century skills, and ISTE standards that these tools help students meet. For each of these tools the district also has a limited number of kits for teachers to check out with their students in addition to multiple 3D printers at every building. Our high school is considering adding a CTE Introduction to Computer Science elective class in the near future, and one of our goals for next year is to create a K-12 Computer Science framework to detail the progression of skills and opportunities we want to offer our students. We are looking at many different options to intentionally and systematically expose our students to Computer Science at all grade levels.

Clarkston High School is offering computer science for the first time this year. We offer two semester-long classes for students. Students can take Introduction to Computer Science in the fall and Introduction to Computer Programming in the spring. We plan to expand our offerings next year and hope to build a 4-year program for our students with a variety of options.

ESD 171. *In September, we sent out a CS Census Survey to get a better picture of where our districts are in terms of implementing computer science. We are currently working on a brief of the survey data and outcomes that will be shared with the school districts and communities in North Central Washington. At NCESD we are supporting computer science through the creation of a PLC with CS Leads in each district. Our region participated in the statewide CS PLC day and are planning the next two meetings in February and April this year.*

There are 16 districts in the ESD171 region implementing TEALS. NCESD is providing support for these districts through outreach. We have also partnered with

Microsoft to lead a steering team that is working to build articulation pathways for students to earn post-secondary credits for the coursework that is completed through the TEALS program. We partnered with a local tech company and the Wenatchee Valley Skills Center TEALS students and teacher, Kim Anderson to develop the first computer science internship. Students applied and two students will begin their internships this month!

Through partnership with FIRST robotics, NCESD hosted one introductory Robo101 training and one advanced topics training for middle school educators in November. In December, we facilitated the 2nd annual Wenatchee Regional Qualifier for FIRST Lego League robotics. There were 24 teams (223 students) in attendance from 9 school districts. We updated Congressman Dan Newhouse on our needs and goals for computer science education and he wrote his first line of code on Oct. 26th with a lesson from the Quincy High School TEALS students. Photo: <https://photos.app.goo.gl/oc6i2vkN5BUM9fd26>. We partnered with Microsoft Tech Spark to offer support to teachers and schools who wanted to offer the Hour of Code as an evening outreach event to build community engagement and support for computer science education. In total 11 schools offered evening events with a combined attendance of 1146! Legislators from the 13th district even stopped to participate and write a few lines of code.

ESD 189. *We had our first Computer Science Network Meeting (PLC) on October 9th, with 9 teachers and instructional/tech coaches. The meeting agenda included an overview of the state work in computer science, learning about what is happening in each district around CS, learning what computational thinking is, and participating in a computational thinking activity using Legos. Our second Network meeting is scheduled for January 8th and we currently have 27 people registered! During this second meeting we have invited a TEALS representative to talk to the group. We also have a code.org training scheduled for March 23rd.*

III. Progress toward Measurable Objectives

The measurable objectives for 2019-2020 are as follows. The data reported provide progress toward the outcomes as of January 25, 2019.

Objective 1: Increase the number of students, from underrepresented groups, who have equitable CSE access from 25,698 (baseline) to 80,920.

Across all of the ESDs, participants provided an additional 23,601 students with Computer Science instruction for a total of 49,299 students.

Objective 2: Increase the number of teachers with CSE expertise (Teacher Leader Cadre) by 54 or more.

Across all of the ESDs, 55 teachers have received training and improved their Computer Science education expertise.

This objective has been met.

Objective 3: Increase the number of district level administrators with CSE awareness by 35 or more.

Across all of the ESDs, 17 district level administrators have received training thus far and increased their Computer Science education awareness.

Objective 4: Increase the number of districts with a Computer Science Education (CSE) strategic plan that creates computer science pathways for Washington students across all grade levels by 35 or more.

This objective will be achieved using software called SCRIPT. The ESDs will provide technical assistance and guidance to school districts to develop their strategic plan using SCRIPT. In preparation, all ESD Computer Science Leads will be trained by the Computer Science for All in March 2019 in Yakima. The ESD Leads will then work with the districts to provide professional development using SCRIPT. The professional development will empower the districts to monitor levels of CSE

implementation and provide pathways for growth district wide. The ESD Leads are currently building supportive working relationships with the District Computer Science leads and will be well-positioned to achieve this objective.

Objective 5: Increase knowledge, skills, and abilities related to the integration of CS into content areas from baseline by 50% or more for 100% of teachers served.

The baseline measurement was collected from an item on the Pre Survey designed to measure participants’ ability to integrate computer science into their content area. Out of 121 participants, 95 provided responses. Out of the 95 respondents, the majority (42%) of the participants felt their ability to integrate computer science into content areas is “emerging” while 35% felt they were “effective”. Approximately one out of five considered themselves “novice” while 4% felt they were “highly effective.” The Post survey will be administered between late spring and early summer. The final Computer Science Evaluation Report will summarize participants’ change in the knowledge, skills and abilities related to the integration of CS into content areas.

Table 3. Participants’ self-rating of ability to integrate CS into content.

Ability to Integrate CS into Content Area (PRE)	Number of Participants	Percent
Novice	18	19%
Emerging	40	42%
Effective	33	35%
Highly Effective	4	4%
Total	95	100%

Objective 6: Increase awareness, knowledge and skills related to the application of culturally relevant pedagogy from baseline by 50% or more for 90% of teachers served.

Based on the results of last year’s evaluation report, program leadership is in discussion with OSPI to determine if this objective is valid for this year.

IV. Next Steps

The ESDs have launched a successful collaboration that started prior to the grant award during the planning phase. They continue to meet and collaborate bi-weekly to implement the coordinated

computer science activities across the state. The infrastructure is in place to support the work going forward into next year. The evaluator will work with the AESD Network to track progress toward the objectives and submit a final evaluation report.