

BBCC to expand data center training program

- Posted By [Tiffany Sukola](#)
- Posted on: August 23, 2019



MOSES LAKE —Big Bend Community College’s Data Center training program is set to expand starting this fall, with the inclusion of training for more industries and the start of a new Mission Critical Operations pilot program.

The college first offered the data center program in the Fall of 2017 and several students from the pilot cohort have recently moved from the classroom into full-time jobs at data centers in the area. The program utilizes work-based learning partnerships, which allows students to gain hands-on experience before graduation.

However, until now, the program primarily focused on training for Information Technology (IT) jobs in the regional data centers but the skills learned can be transferred to any small, medium or enterprise business or organization that uses computers, networks, servers or cloud services.

“Just about every organization that uses computers that are connected to a network needs these skills,” said BBCC Computer Science Specialist Tom Willingham. “We will focus our work-based learning components of the program on the industry that the student chooses. We will connect each student with an industry partner.”

Willingham said the new Mission Critical Operations program will prepare students for entry-level facilities manager positions. Some companies call these positions facilities or building engineers, but employees in these positions could potentially make between \$48,000 to \$60,000 per year.

“We are going to train and turn out students with the right tools to handle Mission Critical Operations for any company,” said Vantage Data Centers Director of Operations and BBCC instructor Mark Johnson.

Mission critical is a popular industry term used to describe the essential services required for day-to-day operations that could impact the bottom line or cause a potential shut down.

The new program will concentrate primarily on industries with large facilities to manage, such as data centers, manufacturing, and food production. However, these essential services are also critical to hospitals, schools, and other large facilities.

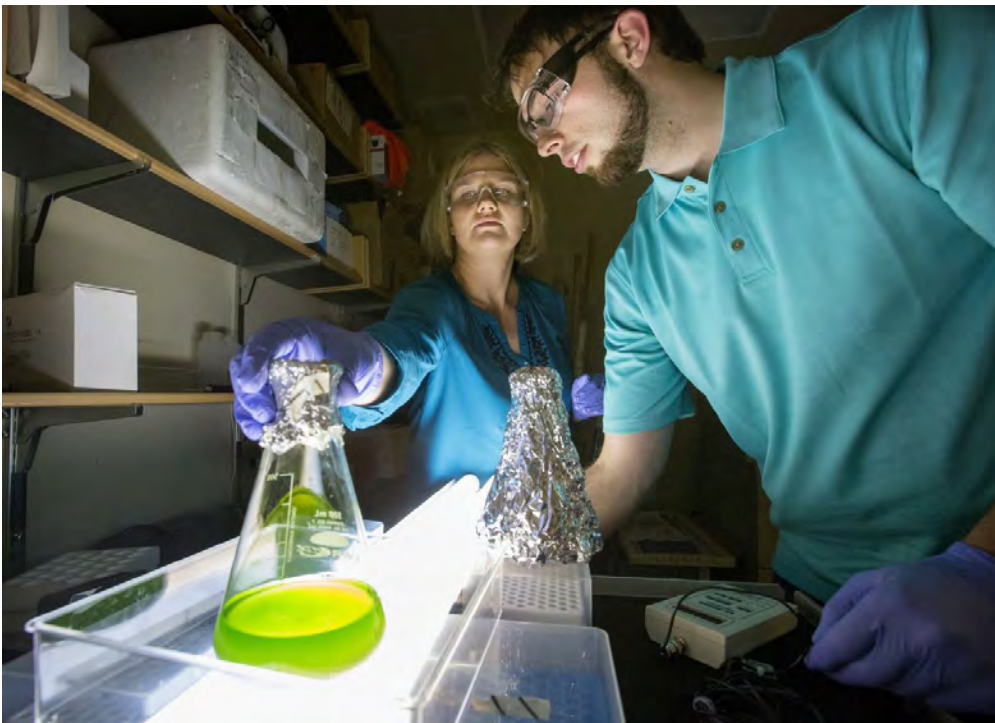
“We have been working with Vantage, Sabey, NTT, Microsoft, and Titan Data Centers with help from Schneider Electric employees to understand how to build a program that they can use. The industry input and support has been fantastic,” said Willingham. “This time, we will build the program with other industries in mind from the beginning and work with them to tailor the program and classes as we build them.”

To learn more about the data center training program or the new mission critical operations program, contact Tom Willingham at 509-793-2321 or tomwi@bigbend.edu. Fall quarter classes begin Sept 23

https://www.wenatcheeworld.com/news/local/wvc-researchers-seek-clues-to-algae-s-flair-for-self/article_57f178ea-10b9-5d6c-b71d-6052b97ef011.html

WVC researchers seek clues to algae's flair for self-healing

Mike Irwin May 9, 2017



Nataliia Piestrup and Jared Harris team up to study recover rates of light-damaged algae in Wenatchee Valley College's biology labs on May 1. Here they introduce damaged algae to specific amounts of light to see how well they repair themselves.

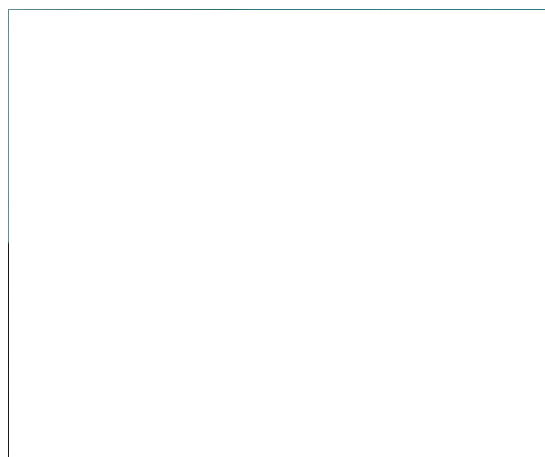
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WORLD PHOTO/DON SEABROOK

WENATCHEE — Aside from friends and family, the creatures that Nataliia Piestrup and Jared Harris have come to know best in the last year are “Chlamy” — tiny, green and wiggly Chlamy.

The two student researchers in Wenatchee Valley College's biology department have studied billions — more likely trillions — of single-celled *Chlamydomonas*, an algae they nicknamed Chlamy, to determine how sunlight damages the tiny critter's DNA and, remarkably, how it heals itself.

“This algae has two repair processes that scientists have always thought operated independently of each other,” said Piestrup, a nursing student with an interest in biological research. “We're taking steps to prove the two repair systems are connected.”



Presented last year at the Idaho Conference for Undergraduate Research at Boise State University, Harris and Piestrup's preliminary findings could have broad applications for applied plant biology, particularly with regard to the responses of crops, forests and other ecosystems to a changing climate. The findings could be especially important to regions where the amount of sunlight — and therefore ultraviolet light — is on the rise.

For instance, an increasingly patchy ozone layer could allow more harmful ultraviolet light to bathe the ocean's surfaces and damage light-sensitive sea life. If so, how do Chlamy populations not only survive UV bombardment but actually repair their damaged DNA strands?

On March 30, Harris and Piestrup also nabbed one of the Greater Wenatchee Area Technology Alliance's 2017 Innovator Awards — the Problem Solving Innovator Award for post-secondary students.

The pair admitted their research alone might not change the world. “But combined with the work of other scientists,” said Harris, whose studies have ranged across biology, chemistry and engineering, “we could reach a better understanding of the single-celled creatures that are so important” to the planet.

Chlamydomonas, a unicellular flagellate (it waves antenna-like arms), is a critical component of the world ecosystem that consumes carbon dioxide and produces oxygen. The green algae is often used in research experiments because of its simple genetic structure, use of photosynthesis and widespread dispersion through different environments.

Piestrup, 34, and Harris, 25, joined forces last summer after discovering some similarities in their individual research projects. The pair were encouraged by WVC professors and friends to pool their experiments and research findings towards studying Chlamy's damage-and-repair systems.

The team's studies are a project assigned by biology professor Steven Stefanides, who in his broader algae research turns to students for specific experiments. Stefanides and adjunct professor Sue Kane, Wenatchee's Apple STEM Network planning director who also has research underway, have enlisted the aid of five students this school quarter to conduct targeted studies, with more students eager to sign up. Stefanides estimated eight students could be part of the program by fall quarter.



A native of the Ukraine, Piestrup moved to Leavenworth four years ago with her husband Phelan Piestrup. She now has two children, ages 8 and 3, is working towards a WVC nursing degree and sometimes spends hours each day in the lab.

"It's a lot," she laughed. "But coming here (to the U.S.) opened doors that allowed me to follow what I truly loved — science, medicine, biology — and the opportunities are everywhere. I mean, in this country you can do whatever you want. The possibilities are amazing."

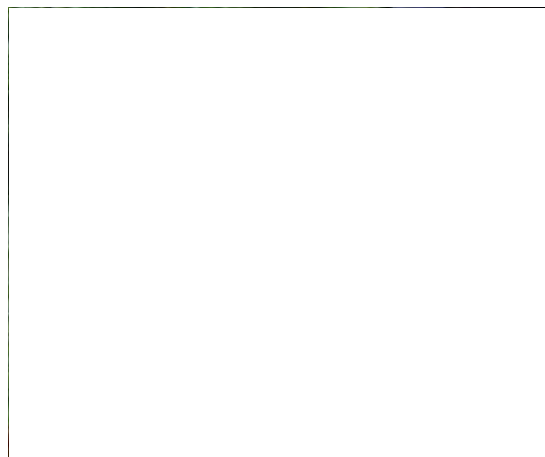
Harris moved around the Northwest with his family before settling 12 years ago in Wenatchee. He credits two WVC teachers — biology profs Stefanides and Kane — for "opening my eyes to the world of science, and showing me that I was a scientist at heart."

The science teammates said working together adds a new dimension to their research. "It's beneficial," said Harris. "We can bounce ideas off each other, correct each other's mistakes."

Goggled-up and gloved, Harris and Piestrup work in WVC's biology lab with standard equipment — beakers, test tubes, microscopes — but also with newer devices that separate DNA strands from crushed Chlamydomonas, then measure and record the DNA damage on light-sensitive plates.

Now, after hundreds of tests, Harris and Piestrup have found that damage caused by ultraviolet light to Chlamy's strands of DNA can be fixed by two repair systems within the cell. One of those systems uses blue light to trigger a healing enzyme; the other works in dimmer conditions using a chemical repair mechanism. The two systems are likely connected.

The testing likely won't end soon. Harris and Piestrup each have another year before leaving WVC, and students after them will likely pick up their research or a similar line of inquiry.



"The great thing about science is that we go beyond assumptions," said Piestrup. "We test and test some more until the evidence is clear. Until we hopefully gain some understanding."

https://www.wenatcheeworld.com/education/wvc-considers-four-year-business-degree/article_0e906940-a40a-11e9-ac79-6b91fcd9d3e4.html

WVC considers four-year business degree

By Nevonne McDaniels

World staff writer

Jul 11, 2019

WENATCHEE — Wenatchee Valley College wants business owners to weigh in on what training to include in a potential new four-year bachelor's degree in business.

If the program moves forward, it would be the fifth bachelor of applied science degree offered by WVC, joining nursing and engineering technology degrees introduced in 2017 and teaching and data analytics which could start as soon as winter quarter.

A 24-question survey about the proposed business degree was posted to the college's Facebook page Wednesday, designed to measure interest in hiring employees with an applied science business degree and determine what skills and areas of expertise are most needed.



Based on the results, the workforce education advisory committee will determine next steps, said Libby Siebens, a WVC spokeswoman.

"A proposal takes about a year to develop," she said, including putting together a program outline and getting it through the state approval process.

The bachelor of applied science degrees offered by WVC are more hands-on than bachelor's degrees offered by four-year universities that include more theory and research, Siebens said. Most build on two-year professional and technical degrees.

The data analytics program is a good example, she said. It stemmed from the needs of public utility districts and tech companies looking for a specific emphasis on math and science. WVC received final approval last week on the program from the State Board for Community and Technical Colleges.

"It could be as early as winter 2020 when the program begins," Siebens said.

The teaching degree, for preschool through third-grade special education, has been approved by the state board, but is waiting on a sign-off by the Professional Educator Standards Board and Northwest Commission on Colleges and Universities.

An agriculture degree also is in the early research stage, she said.

Enrollment and anticipated enrollment in the bachelor's degree programs vary. The first class of 19 nursing students earning RN-to-BSN degrees graduated in August 2018 and 16 graduated in 2019. This year, 16 students are enrolled full time and two are enrolled part time, Siebens said.

WVC's total enrollment is about 7,000 students.

For the link to the business degree survey, go to wwrld.us/2XGn3Xa.

MORE INFORMATION

WVC adds four-year nursing degree

Nevonne McDaniels

Reporter

Nevonne can be reached at 664-7151 or mcdaniels@wenatcheeworld.com.

https://www.wenatcheeworld.com/opinion/guest-opinion-wenatchee-valley-college-what-a-bachelor-s-degree/article_0c46114c-40c3-5388-aeb9-48cb12dc436f.html

Guest Opinion | Wenatchee Valley College: What a bachelor's degree in nursing means for students, North Central Washington

By Dr. Jim Richardson Oct 29, 2018



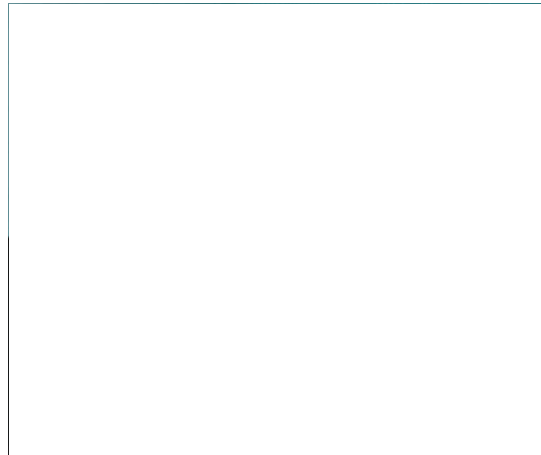
Dr. James Richardson

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History was made in August when Wenatchee Valley College granted its first-ever bachelor's degree since the college was founded in 1939. During a ceremony at the Music and Art Center on campus, 19 students graduated from the Registered Nurse to Bachelor of Science in Nursing (RN to BSN) program.

This graduation was much more than just another ceremony. It was the result of nearly a decade of hard work at WVC by dozens of dedicated staff and instructors, and a huge victory for our community and health care providers.

Dr. Walt Tribbley, former dean of allied health and current the president at Monterey Peninsula College in California, spoke at the graduation on Aug. 17. He was still working at WVC when the program was first discussed in 2009.



“You’ve taken a great risk, every one of you is a pioneer,” he told the graduating students. “You weren’t alone in this pioneering spirit, in fact, you’re a product of it.”

The graduation this summer was in part a celebration of the work done by Jenny Capelo, dean of allied health; Dr. Carli Schiffner, former vice president of instruction; and Dr. Kristen Hosey, nursing programs administrator. For nearly a decade, these women, with the help of supportive WVC faculty and staff, worked to garner administrative support, design the curriculum for the program and find the staff to support it.

As the program developed, it became increasingly clear to us at the college that there was a great need for a program like this in North Central Washington.

Our region has the fewest bachelor’s prepared nurses in the state, at 26 percent. Meanwhile, there is a nationwide push in the nursing industry for 80 percent of nurses to have a bachelor’s degree by 2020. Bachelor’s prepared nurses are equipped to be leaders in their field. They enter their workplaces with additional training in systems-level management, communication and research skills.

One of the original goals of this program was to increase access to education. Rather than expecting our local registered nurses or our nursing students that are completing their nursing transfer degree to enroll in a college or university farther away from their work or home, we’ve brought a four-year degree option to them.

In addition to the vision and leadership from many at the college, we've received enormous support from our surrounding community.

Dozens of partners throughout North Central Washington, including most major medical facilities in the region, school districts and others, have been instrumental in shaping the program. Not only do our partners sit on advisory committees and offer feedback about how to prepare our graduates and students, they also host our students for visits and clinicals, providing a space for them to get valuable hands-on experience.



At the graduation ceremony this year, all 19 RN to BSN students presented research that they conducted here in North Central Washington on topics ranging from opioid policy development, to health education for antimicrobial resistance, to investigation into cancer clusters. Thanks to these partnerships, students are present in their communities, conducting real-world research that will benefit their patients and others like them and improving health outcomes in the region.

Clint Paslay, 37, is making differences in his community for patients and nurses thanks to his two nursing degrees from Wenatchee Valley College. Paslay currently works on quality and performance improvement and risk management in the antimicrobial stewardship program at Coulee Medical Center (CMC), a new position he applied for after completing the RN to BSN program. He received his associate degree in nursing from Wenatchee Valley College in 2010 and was eager to get his bachelor's degree when he heard WVC would be offering one. While getting his bachelor's degree on the Omak campus, Paslay was a registered nurse in the emergency department at CMC. He juggled full-time work, full-time school and being a father to his three kids and graduated with the inaugural class this summer. He said the degree, which included his practicum experience at CMC researching antimicrobial resistance, prepared him uniquely for his new job at CMC.

"The two-year program really prepares a nurse to be a good bedside nurse and provide excellent patient care. The bachelor's portion of it really focuses on evidence-based practice and research," Paslay said. "It just really makes you start thinking from a bigger picture. How can you make changes at the larger level

that will affect care all the way down to the bedside? ... There's the aspect of organizational change. What can I do in my hospital to make our care better for patients and make outcomes better for patients?"

It is a triumph for the college and the community when Wenatchee Valley College can send confident, competent students out into the world — prepared to be leaders and innovators in their field.

All of us at the college are immensely grateful for the faculty, staff, hard-working students and community partners that made this triumph possible, and who turned the only community college in North Central Washington into a four-year-degree-granting institution.

Dr. Jim Richardson has been president of Wenatchee Valley College since 2005. Learn more about WVC at wvc.edu.



NCW Computer Science Pathways

2019 Pathway Articulation Report



Our mission is to ensure that there is an equitable path in Central Washington for computer science education.

During the first annual Central Washington Pathway Summit on March 11, 2019, sponsored by Microsoft Philanthropies, more than 50 educators and partners from throughout North Central Washington came together to discuss pathways for rural students to have access to computer science education.

Why is it important?

Our vision is for all students to have access to computer science credentials and for students to know at the time they enroll in the high school course, when there is an opportunity to earn college credits, how to access the credits, and where those credits will be applied to a credential or degree. This will allow educators, students and families in North Central Washington to make informed decisions for the future.

Community colleges have a critical role as an intermediary educational institute in credential pathways like computer science, bridging K-12 and University systems. One quarter of all students graduating high school in North Central Washington begin higher education at one of two community and technical colleges (42% of all college-bound students). Enrolling in a local community college allows students a way to work towards a degree or credential from a familiar community, with some familial support, and work options nearby.

The State of Washington has invested in these paths with a system of dual enrollment options to help students get a 'jumpstart' towards post-secondary credentials. The educational data around students earning college credits while in high school is quite compelling. Students who earn at least 12 college credits while in high school are on average, more likely to earn their high school diploma, continue on to post-secondary education, and earn a post-secondary credential or degree.

Hosted at Central Washington University, attendees included partners from K-12 and higher education, business and industry, students, and state leaders who are committed to ensuring that there is an equitable pathway for students in Central Washington to pursue computer science careers. Together, this body identified a shared set of recommendations to articulate a computer science credential pathway for students in

At present, there are a handful of dual credit articulation agreements between select school districts and higher education partners, for computer science courses. However, the agreements for articulation into these pathways are not equitably accessible for all youth in North Central Washington.

Students in North Central Washington are at a competitive disadvantage when compared to students in more urban districts in the state. Rural students have fewer opportunities to take courses like computer science in high school, there is a severely limited number of credentialed, rural computer science educators, and rural students have inequitable access to most dual credit opportunities in computer science.

In 2018, 16 schools in North Central Washington have forged strategic partnerships with generous philanthropic partners, like Microsoft and Code.org, who are providing curriculum and technical expertise for rural schools to implement industry relevant, introductory computer science courses for high school students.

This foundational learning is invaluable. Now, the regional postsecondary educators: Big Bend Community College, Wenatchee Valley College, and Central Washington University, have come together to look for ways to improve opportunities for students in computer science and STEM through new degrees and pathways.

This collaborative effort will light the way for students to find a firm path towards a computer science degree or credential in North Central Washington that begins in rural high schools.



PART 1

Pathway Articulation

Challenges

The current pathway to computer science credentials has significant barriers and students are asked to repeat coursework as they transition from secondary to post-secondary institutions and between higher education institutions. The misalignment can have a detrimental effect on student persistence in the program, and credential attainment.

Students who transfer from a community and technical college to a university to pursue a degree in computer science have a significant challenge in attaining the necessary skills progression for computer science, as well as meet the general breadth requirements to earn an Associate of Arts and Sciences (AAS) Degree recognized under the current Direct Transfer Agreement (DTA). Frequently, students spend additional time and resources ensuring that they meet necessary curricular prerequisites for their program and meet the specific requirements of the AAS - DTA. These additional courses put strain on rural students in North Central Washington and can even compromise essential access to financial aid.



45%
of the region's high school CS classes transfer to a community college



1 OF 3

1 OF 3
of the region's largest schools (>1300 students) offer a CS class



69%
of the region's high schools offer CS classes for students

* Data is taken from 28 of North Central Washington's high schools ranging from 71 students to 2,300 students. Districts included: Brewster, Bridgeport, Cascade, Cashmere, Coulee Hartline, Eastmont, Entiat, Ephrata, Grand Coulee Dam, Lake Chelan, Mansfield, Manson, Methow, Moses Lake, Nespelem, Okanogan, Omak, Oroville, Pateros, Quincy, Soap Lake, Tonasket, Warden, Waterville, Wenatchee, and Wilson Creek.

Recommendations

It is essential to increase awareness about the foundational computer science skills that students develop at each stage and to improve alignment in articulations. The computer science field is continuously evolving and the steering team recommends a collaborative annual review of the skills mastered at each level.

The steering team has identified the following significant challenges that will require additional capacity, review and consideration for pathway alignment:

1 New Articulations

Systematic annual review of high school computer science course offerings and regional articulation agreements, and specific outreach to expand access to dual credit opportunities. Such review and analysis this year produced several new articulations and expanded opportunities for students in several rural districts to earn up to 8 college credits for the year-long Introduction to Computer Science TEALS course.

2 CS Language Fluency

Students typically begin computer science education in one computer language, building foundational skills and eventually mastering multiple languages to become proficient computer scientists. Unfortunately, the language students begin learning in, creates significant barriers for rural students as programs at higher education institutions demand proficiency with one language or another to advance. In rural schools, it is not feasible to offer foundational course sequences in multiple languages, but if students will need mastery in multiple computer science languages to be successful in the industry, then there needs to be intentional focus to help students transition to a new language at earlier stages. Big Bend Community College is exploring the development of a short bridge course that would support students with specific skills development to make knowledge transfers, build competency in a new language, and take advantage of their course offerings.

3 Advanced Placement Equivalency Alignment

Several regional high schools offer students an opportunity to sit for the Computer Science Advanced Placement Exam (AP - CSA). The exam scores offer students an opportunity to earn college credits for computer science courses. Until recently, community and technical colleges awarded AP exam-takers only elective credits for strong performance on the exam. Conversely, the 4-year university awarded specific course credit for a required course for the same scores on the AP exam. This structural inequity is an area of significant concern as the great majority of college bound students in rural North Central Washington begin higher education at either Big Bend Community College or Wenatchee Valley College. Fortunately, a recent revision of the State Board Advanced Placement Equivalency Guide offers a significant improvement. Students who earn a 5 on the AP CSA exam, will now be awarded credit for their demonstrated mastery of foundational computer science skills. While this change is a significant improvement, there is still inequity in the regional pathway for development. Students who earn a 3, 4 or 5 on the AP-CSA exam earn computer science credits at University, while students must earn a score of 5 on the AP-CSA exam to earn computer science credits at the community college.

Part 1: Pathway Articulation

4 Career and Technical Coursework Transfer

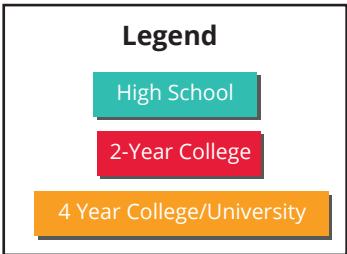
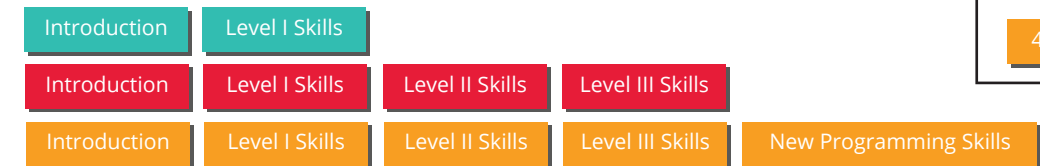
Sixteen regional high schools are utilizing career and technical education (CTE) to offer computer science courses for students. These courses can earn students dual credit at the community college if the course is articulated as a certificate or technical course; however, there is a barrier to articulating these courses to transfer college course numbers.

5 Computer Science Program Transfer Agreements

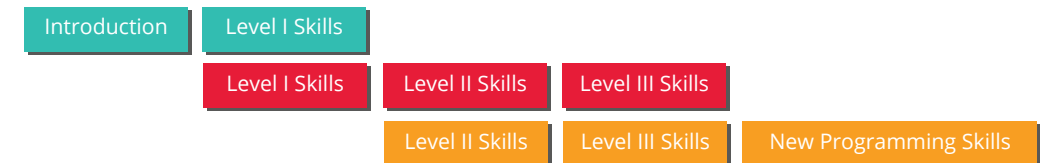
A bi-annual review process would bring additional clarity for students and families to know which associate degree offers the best alignment for students transferring into university programs. This will require greater alignment between computer science programs throughout Washington state. Currently, a Computer Science Education (WA-CSE) working group with representatives from across the state of Washington is working to revise the Associate of Science Transfer degree that offers students an alternative transfer degree pathway and will greatly improve transfer efficiency. Each of the higher education partners in North Central Washington is represented in this working group and collaboratively engaging to improve this critical component of the regional pathway.

Current Programming Education Redundancy

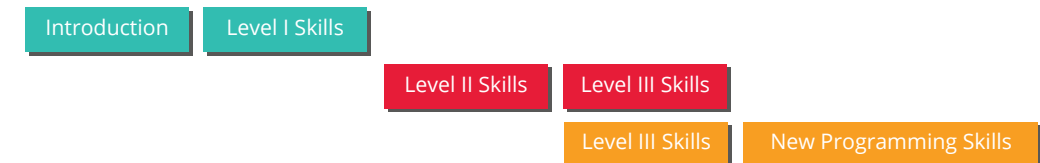
Worst Case - No Articulation - No AP Score Credit - Most Common



Better Case - Some Articulation/Credit - Different Programming Language - Limited



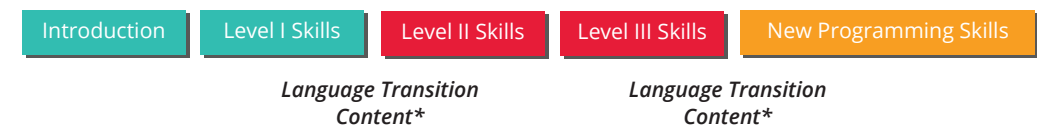
Best Case - Good Articulation/Credit - Same Programming Languages - Very Rare



Proposed Programming Pathway

Ideal Case - Full Credit or Articulation - Language Neutral

* May be integrated at either institution or low-credit options, common course



PART 2

Resources & Community Partnerships

Challenges

Rural schools are less likely than their suburban counterparts, to offer computer science courses (Google & Gallup, 2017). Many times, rural educators feel isolated from others in their field and this can be especially true of computer science educators. Very few school districts in Central Washington have more than one teacher who teaches computer science at the high school level, and some districts have none.

But this is changing rapidly in North Central Washington thanks to the Microsoft TEALS program. In the 2018-19 academic year, 16 school districts offered computer science courses for students in partnership with Microsoft TEALS.

The common course content and course delivery model has the added benefit of providing a foundation for the development of a professional learning community for computer science educators.

Recommendations

The 2019 Central Washington Pathway Summit provided an opportunity to gather educators from K-12 and Higher Education institutions to have a focused conversation about recent developments and practices in computer science education. This occasion also gave educators an opportunity to align the scope and sequence of the development of maintaining vertical team relationships. A desire for connection to other computer science educators emerged as a common theme at the Central Washington Pathway summit in 2019.

To expand and reinforce the computer science educator community in Central Washington, the steering team will advocate for the following components:

1 Establish A New CSTA Chapter

Presently there are two established chapters of the Computer Science Teachers Association (CSTA) chapters in Washington State: Puget Sound and Spokane. There are applications pending for the establishment of two additional chapters in central Washington: Yakima and Wenatchee. This distributed network of CSTA chapters will offer regular opportunities to plug in to a regional community of other computer science educators.

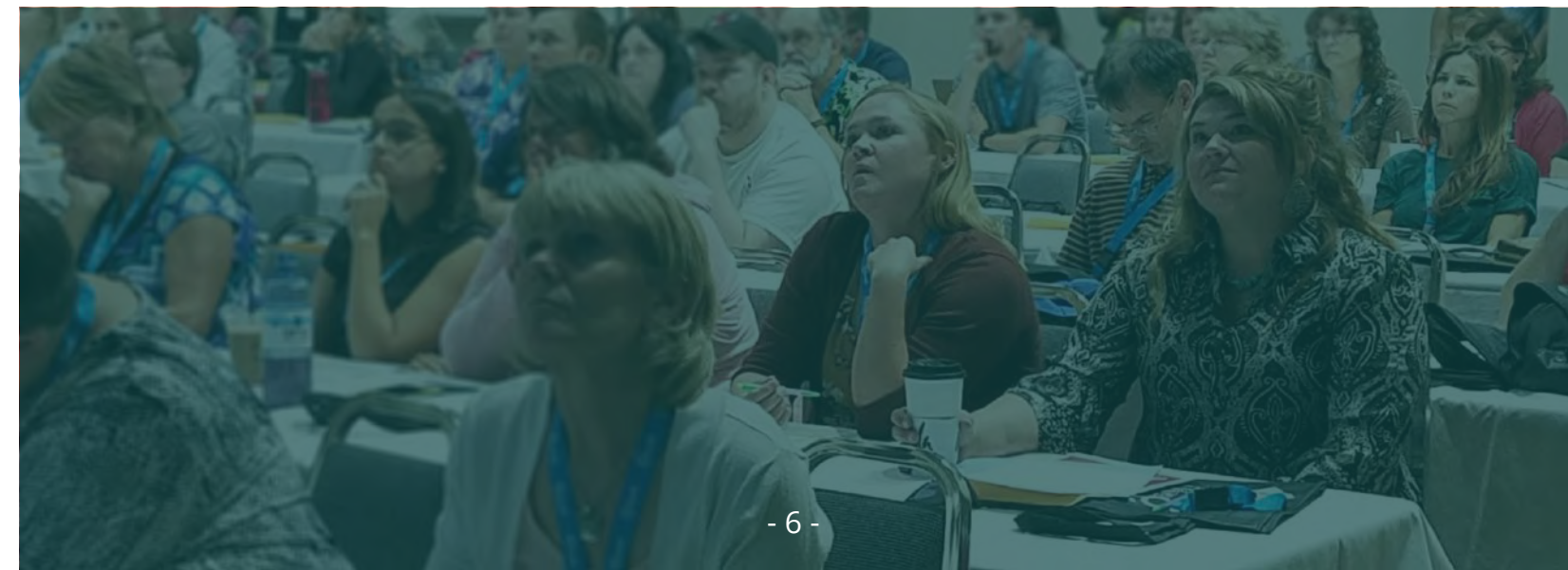
Part 2: Resources & Community Partnerships

2 Resource Repository

There is a need for a centrally organized information hub for materials regarding computer science education and resources. The desired platform could also provide a conduit of communication about local articulation pathways, professional development opportunities, and announcements. *This recommendation has not yet been matched with a resource.*

3 Annual Pathway Alignment Summit

The steering team recommends that there be an annual convening to serve as a platform for educators to continue this professional development and collaboration. *This recommendation has not yet been matched with a resource.*



PART 3

Building Awareness & Outreach

Challenges

There is a shortage of skilled computer science professionals. This year in Washington there will be more than 9,000 new job openings, and there are only 3,000 Washington graduates prepared to fill them. Local industries like agriculture, energy production, manufacturing, health care and natural resource management all have growing need for technology and computer science skills. To create awareness in rural regions, students and their families need to hear about local opportunities in computer science.

Recommendations

To reach students in North Central Washington, there must be a collective commitment to increasing awareness about local opportunities in Computer Science:

- 1 Raise Up Community Voices**

Students and educators need to hear from businesses and community leaders that there is a local demand for computer science. Community partners like Big Bend Community College, Wenatchee Valley College, Wenatchee Valley Technical Skills Center, Columbia Basin Technical Skills Center, Skillsource, Microsoft, GWATA and the Apple STEM Network are working to expand the number of local internships in computer science and technology.
- 2 Increase Awareness About Local Demand**

Students and educators should learn about the usefulness of and demand for computer science skills. It is critical for them to hear about computer science skills needed in regional industries like agriculture, and computer science skills being used in the fields (i.e. GIS workers in the fields, automation and unmanned technology specialists, etc.) as well as the traditional programming settings.

Part 3: Building Awareness & Outreach

- 3 Increase Awareness About Available Training And Educational Pathways**

Students and educators need resources to find available computer science and technology-related programs and advising.
- 4 Increase Awareness About Financial Support For Post-Secondary Education**

Students and educators should become aware of the multiple sources of financial support through grants, scholarships (i.e. WSOS), and other resources beyond the standard Federal and state options available through FAFSA and WAFSA, as well as student support service programs that support computer science students (i.e. MESA). Currently WSOS offers a Career and Technical College scholarship for Computer Science pathways in North Central Washington each year.
- 5 Start Early**

Students need exposure to careers in computer science as early as possible. There are now many schools in North Central Washington introducing computer science in elementary and middle schools. To leverage these early learning opportunities to expand the career pathway, students and their families will need support to navigate the credential pathway opportunities, locally, and throughout the state. Corporate and educational partners should be tapped to support maker's fairs, robotics events, and other fun hands-on computer-related activities for kids.
- 6 Celebrate Success**

Every year, tech savvy students and educators in both K12 and higher education from throughout North Central Washington are recognized at the Innovator Awards Luncheon. Highlighting champions of computer science and technology brings awareness to the success stories happening locally, and inspires other educators, students, and businesses as they see the accomplishments of individuals with similar stories. The steering team is working together on a nomination outreach campaign to encourage more nominations for the Innovator Awards.

The Future Is Now: Computer Science Workforce

In the spring of 2019, GWATA (North Central Washington's Technology Alliance) released a short film to highlight regional businesses looking for computer science skills in their workforce. Featured companies were eager to participate in the video and promote computer science careers at Stemilt, LocalTel Communications, iSpyFire, and PetHub -- all local technology companies!

Watch online at www.AppleSTEMNetwork.org or by scanning the code to the right with the camera on your phone!

Watch video



PART 4

Equity, Inclusion and Strategic Outreach

Challenges

There are just over 3,000 youth preparing to exit the K-12 system this year in North Central Washington. Of these, 49% are female, 46% come from a home that is considered rural, 67% are low income, 52% are students of color.

There are nearly 300 students currently enrolled in introductory computer science courses at regional high schools in North Central Washington, and while there is not currently data reported about the demographic representation of students in these courses, it is widely understood that the students in computer science courses do not demographically reflect the region. Only 24% of the computer science bachelor's degrees awarded in Central Washington in 2017 were awarded to students of color, and just over 10% of computer science bachelor's degrees were awarded to women.

New partnerships and Microsoft philanthropy empowered 16 rural school districts in North Central Washington to offer computer science for the first time through the Microsoft TEALS program. This program has opened the door for significantly greater numbers of students to pursue computer science credentials. However, the nearly 300 students in the TEALS classrooms this year, do not reflect the regional demographics.

Collectively, we recognize the need to work together to create greater engagement for underrepresented populations including women, first-generation college-bound students and students of color.



Map: 2018-19 North Central Washington Microsoft TEALS Districts

Part 4: Equity, Inclusion and Strategic Outreach

Recommendations

To increase equity in the computer science cohorts:

1 Targeted Outreach And Recruitment

To reach more first-generation, rural students, female students, and students of color we must be intentional in designing a pathway that originates where the students are, in rural schools. We must continue to develop and renew articulations to increase efficiency and ensure a fluid transition for students as they begin post-secondary education. Recruitment to post-secondary programs should help students understand that the computer science skills they are mastering in their high school computer science courses are valued and that there are programs ready to build onto this foundation. Recruitment strategies should also include regional events and "meet-ups", potentially including evening events to engage families.

2 Differentiate The Pathway

To increase the number of computer science credentials in North Central Washington, there must also be a way for students to begin coursework in a post-secondary environment in addition to those starting in high schools. While introductory programming courses have been offered for some time at Big Bend Community College and Wenatchee Valley College, differentiating the starting course for students will likely impact the cohort size for introductory courses. When courses have low enrollment, they can be at risk of cancellation. If introductory courses are not offered, students who begin post-secondary education, without computer science skills, are disadvantaged. Therefore, it is imperative that there be a continued institutional commitment to offer introductory courses, or alternative options, for students choosing to begin the credential pathway at the community college.

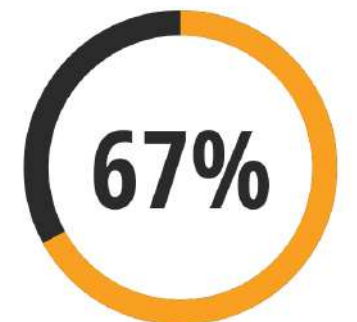
NCW Student Demographics



49% of students are female



52% of students are people of color



67% of students are from low income households.

RESOURCES

Course Descriptions, Equivalencies & Pathways

Equivalencies for High School Introductory Computer Science Courses

Intro CS TEALS or CS Principles

WVC	BBCC	CWU
CSC 101 (5 credits)	*CS 101 (3 credits) * CS 111(5 credits) *QHS Model	CS105 (4 credits if from WVC; CS101/CS LD 8 credits if from BBCC)

Equivalencies for High School AP Computer Science Courses

AP TEALS (based on UW course CSE 142/143)

WVC	BBCC	CWU
N/A (needed)	CS&141 (5 credits - if we could articulate via CTE dual credit)	N/A

AP Computer Science A (with exam) for Credit

WVC	BBCC	CWU
CSC&141 (5 credits*)	CS&141 (5 credits*) Must score 5	CS110 ONLY (4 credits with score of 3 or 4) CS110 & 111 (8 credits with score of 5)

Resources: Descriptions, Equivalencies & Pathways

High School Computer Science Course Descriptions

Introduction to Computer Science | Introduction to Computer Science TEALS

A high school course that focuses on computer theory, computing problems and solutions, and the design of computer systems and user. This course introduces fundamental concepts using the visual programming language Snap and the industry-standard programming language Python.

AP Computer Science | AP CS TEALS

The AP CS A course prepares students to take the College Board AP computer science exam. This challenging class is for students who are interested in an in-depth course in computer science theory and practice. Students will learn to program in the Java language, with emphasis on problem solving, computer science theory, applications, algorithms, programming style, and programming design. Students devote at least four hours weekly in class and at least one hour per day outside of class to succeed in this course.

Post-Secondary Computer Science Course Descriptions

BBCC --- | WVC CSC101 | CWU CS105 Course equivalent to INTRO TO CS TEALS only at WVC

WVC CSC101 (Introduction to Programming) Introduction to computer programming. Intended for non-science majors. Explores the basics of computer programming using the BASIC language. Topics include console I/O, variables, expressions, decisions, arrays, repetition, console graphics, file I/O and functions.

CWU CS105 (Logical Basis of Computing) Students develop mathematical and quantitative reasoning skills by learning the fundamentals of computer programming. Students gain an understanding of possible connections between technology and artistic expression.

BBCC CS101 | WVC --- | CWU CS101 Course equivalent to first semester of INTRO TO CS TEALS at BBCC and CWU

BBCC CS101 (Introduction to Computer Science) An introduction to computer science concepts and the role of computers in society. Topics include the history of computing, computer hardware, operating systems, the Internet, database management, an overview of programming languages, careers in computer technology, and the ethics of computing. This course is designed for Computer Science majors, and will emphasize principles and underlying computer technology concepts. *BBCC doesn't offer this course anymore, it is for recording purposes only*

CWU CS101 (Computer Basics) Integrated, project-based course using student-produced working materials in the form of a mini thesis. Microsoft Office tools are learned in a web-based practical application environment.

BBCC CS111 | WVC --- | CWU CS LD (no equivalency) Course equivalent to second semester of INTRO TO CS TEALS at BBCC and CWU

BBCC CS111 (Intro to Computer Programming) An introductory computer programming course. Students learn to write and debug simple text based programs while exploring the fundamental principles of programming. Topics for study include input / output, statements, expressions, operations, variables, data types, control structures, program modularization, basic data structures and file input and output.

Post-Secondary Computer Science Course Descriptions (continued)

BBCC CS&141 | WVC CSC&141 | CWU CS110

Courses equivalent to AP-CSA Exam (Score 5 at BBCC or WVC; Score 3 or higher at CWU)

BBCC CS&141 (Computer Science I: Java) This course introduces students to the fundamental concepts of object-oriented programming with the Java programming language. The course will focus on the strengths of Java to create classes, objects and methods, algorithm development, program solving techniques, basic control structures, primitive types, and arrays. Students will master the basics of Java, developing solid programming skills that enable crossover programming skills for other essential languages.

WVC CSC&141 (Programming Fundamentals) Introduces programming fundamentals using a procedural, object-oriented language. Topics include expressions, simple I/O, data storage, variable usage, decision and repetition control structures, functions and parameter passing, design principles, and problem solving strategies.

CWU CS110 (Programming Fundamentals I) This course introduces students to the fundamental concepts of object-oriented programming with the Java programming language. The course will focus on the strengths of Java to create classes, objects and methods, algorithm development, program solving techniques, basic control structures, primitive types, and arrays. Students will master the basics of Java, developing solid programming skills that enable crossover programming skills for other essential languages.

BBCC CS&142 | WVC CSC&142 | CWU CS111

BBCC CS&142 (Advanced Programming with Java) Advanced Java is a follow-up to the programming concepts introduced in the Java I course. This course explores Java's Distributed Applications features and covers inheritance, exceptions, graphical user interfaces, recursion, and data structures.

WVC CSC&142 (Intermediate Programming) Introduces the concepts of object-oriented programming to students with a background in the procedural paradigm. Topics include project management, classes, APIs, instantiation of objects, references, lists, file I/O of records, inheritance, composition, polymorphism, interfaces, exception handling, computer graphics, and basic GUI programming. Intermediate JAVA.

CWU CS111 (Programming Fundamentals II) Continuation of object-oriented programming concepts introduced in CS 110. Inheritance, exceptions, graphical user interfaces, recursion, and data structures.

Resources: Descriptions, Equivalencies & Pathways

Sample Central Washington University Computer Science Pathway

While at community college and high school dual credits:

ENG101 - Composition I: Critical Reading and Responding

BBCC ENGL&101 | WVC ENGL&101

ENG102 - Reasoning and Research

BBCC ENGL&201 | WVC ENGL&201

MATH153 - Precalculus Mathematics I

BBCC MATH&141 | WVC MATH&141

MATH154 - Precalculus Mathematics II

BBCC MATH&142 | WVC MATH&142

MATH172 - Calculus I

BBCC MATH&151 | WVC MATH&151

CS110 - Programming Fundamentals I

BBCC CS&141 | WVC CSC&141

CS111 - Programming Fundamentals II

BBCC CS&142 | WVC CSC&142

After transferring to Central Washington University:

CS Pre-admission requires 17 credits. This is a rigorous schedule and many students will actually take 7 or 8 quarters instead of 6, but it is possible in 6.

Year 1

Fall Quarter - 15 credits

CS301 - Data Structures

CS311 - Computer Architecture I

CS325 - Technical Writing in Computer Science

CS112 - Foundations of Computer Science

Winter Quarter - 14 credits

CS302 - Advanced Data Structures and File Processing

CS312 - Computer Architecture II

MATH260 - Sets and Logic

CS392 - Lab Experience in Teaching Computer Science

Spring Quarter - 17 credits

CS380 - Introduction to Software Engineering

CS420 - Database Management Systems

MATH330 - Discrete Mathematics

CS446 - User Interface Design and Development

Year 2

Fall Quarter - 18 credits

CS61 - Principles of Language Design I

CS480 - Advanced Software Engineering

CS427 - Algorithm Analysis

CS Elective

Winter Quarter - 16 credits

CS362 - Principles of Language Design II

CS81 - Software Engineering Project

CS Elective

CS Elective

Spring Quarter - 15 credits

CS470 - Operating Systems

CS489 - Senior Colloquium

CS492 - Laboratory Experience in Teaching CS

CS Elective

CS Elective

Pathway Articulation Steering Team

Computer Science Focus 2018-19

Riva Morgan

Wenatchee Valley College/Apple STEM Network

Tom Willingham

Big Bend Community College

Gayla Stoner

Central Washington University

Lauren Hibbs

Central Washington University

Dave Rex

Central Washington University

Michael Harrod

Central Washington University

Megan McConnell

Central Washington University

Ian Morris

Central Washington University

Shawn Lowney

Central Washington University

Nicole Monroe

Quincy School District/Apple STEM Network

Dennis Conger

Wenatchee School District/Apple STEM Network

Sue Kane

North Central Educational Service District/Apple STEM Network

Lisa Karstetter

Microsoft TechSpark



Back Row (left to right): Tom Willingham, Megan McConnell, Nicole Monroe, Lauren Hibbs, Shawn Lowney, Mike Harrod; Front Row (left to right): Riva Morgan, Dennis Conger, Gene Sharrett, Dave Rex, Sue Kane

August 27, 2019

FOR IMMEDIATE RELEASE

Contact: Dr. Sue Kane, Director of STEM Initiatives and Strategic Partnerships, NCESD
605-254-3947 / suek@ncesd.org / www.applestemnetwork.org

**Press Release: APPLE STEM NETWORK RELEASES NEW REPORT HIGHLIGHTS PATHWAYS TO
COMPUTER SCIENCE CREDENTIALS**

Wenatchee, Washington – As a home to tech giants like Microsoft and Amazon, Washington State can be synonymous with tech, but at first glance, the eastern side of the State may be overlooked for the technology hub that it's become. The tech jobs aren't just in King County anymore, they're right here. Locally, there is now a steady need for digital skills and computer science in every economic development sector including: healthcare, agriculture, natural resources, energy production, manufacturing and education.

We can be certain that this trend will continue, as the pace of the integration of technology is accelerating. We now see applications of augmented reality, machine learning, and artificial intelligence in energy trade, and even in agriculture and pest management control practices. These technologies have changed everything about the way products and services are developed, delivered and consumed. We can also be confident in the need to develop local talent and provide opportunities for local youth to develop the knowledge, skills and abilities to find a place in the new tech economy.

As a state, Washington has been working on policy to bolster computer science education. Washington State has established K-12 computer science learning [standards](#), and this past year, passed statutes that will require public high schools to offer at least one computer science course ([SB 5088](#)). That course can count as a graduation requirement and can be used as a core admission requirement for institutions of higher education ([SHB 1813](#)). Regionally, that course can also earn college credits and footing on a path to a computer science degree, thanks in part to a local alliance of K-12, higher education and community partners.

Last year, the Apple STEM Network was sponsored by a Microsoft Philanthropies grant to lead a collaborative steering team to assess the current state of CS education in the region. The steering team worked with CWU and Microsoft to host a professional summit last spring, and worked with 501C3 GWATA to produce a video 'call to action' from local business representatives (https://youtu.be/F3Os_01OgZk).

In a [report released this week](#), the CS Pathway Steering Team outlined recommendations for tighter alignment and articulation of computer science coursework towards a post-secondary credential.

The report emphasizes the need to ensure an equitable pathway extends from rural schools to post-secondary institutions. It further urges the development of a connected community of computer science educators and community partners. These foundational steps are essential to ensure that our youth are on-track to future careers in North Central Washington.

[Click here to read the full report.](#)

The Computer Science Pathway Articulation Steering Team includes: Riva Morgan, Wenatchee Valley College/Apple STEM Network; Tom Willingham, Big Bend Community College; Megan McConnell, Central Washington University; Lauren Hibbs, Central Washington University; Dave Rex, Central Washington University; Nicole Monroe, Quincy School District/Apple STEM Network; Dennis Conger, Wenatchee School District/Apple STEM Network; Dr. Sue Kane, North Central Educational Service District/Apple STEM Network; Lisa Karstetter, Microsoft TechSpark.

About Apple STEM Network

The Apple STEM Network is an alliance of K-12, Higher Ed, and community partners in North Central Washington. We represent a diverse region with tremendous potential for STEM industry in agriculture, energies and innovation. With our collective effort we intend to: provide a constructive support system for educators who aim to meet the rising challenge for all students to develop 21st century skills and STEM literacy, to integrate community mentorship and promote authentic project-based learning and field experiences for all levels of education, and engage students in exploring the world of opportunities on the horizon through STEM. For more information visit www.applestemnetwork.org

About GWATA

Since 1999, GWATA (the Greater Wenatchee Area Technology Alliance) has served as the region's tech alliance, championing growth and development in North Central Washington. As a 501(c)3, GWATA's mission is to bring people and technology resources together while supporting entrepreneurs, STEM education, and technology. For more information visit www.gwata.org

FRIDAY, SEPTEMBER 15, 2017



Community Connections | Introducing the 'Science in Our Valley' seminar series

by Dr. Sue Kane | Apple STEM Network | [Sept. 7, 2017, 8:23 p.m.](#)



WENATCHEE — Scientists and science educators in the Wenatchee Valley are organizing a seminar series to catalyze the development of an engaged regional scientific community.

Researchers at Washington State University, Wenatchee Valley College and the local U.S. Department of Agriculture labs, in partnership with the Apple STEM Network, will gather on a weekly basis to take in a seminar about current research. Speakers will be local scientists or invited guest speakers.

Research and teaching scientists from WSU, WVC and USDA met this past summer to discuss building up connections between institutions and within the scientific community in our region to support one-another. Dr. Jim McFerson of WSU and Dr. Sue Kane of the Apple STEM Network formalized the concept with an application for funding from the Our Valley Our Future strategic

planning group. The group received a \$10,000 award.

The Science in Our Valley seminar series begins Wednesday at the WSU Wenatchee Research & Extension Center, 1100 N. Western Ave. In addition to the WSU location, subsequent seminars will take place in the Grove auditorium at Wenatchee Valley College and other area venues at 4 p.m. on Wednesdays. Each seminar will be followed by an informal networking session.

Seminar speakers will initially feature researchers and graduate students involved with agricultural and biological sciences, but will also prominently feature subject matter experts in other fields including climatology, data analytics, hydrology, fire science, power systems and transportation. The speakers, from both the public and private sector, will provide broad exposure, engage relevant industry partners and private research firms. This collaboration will also begin to lay the foundation for creation of the Graduate Research Center, which is identified as a regional “game-changer” by the Our Valley Our Future plan.

The Science in Our Valley seminar series is open to the public, but the content is intended for a “science-based” audience including researchers, post-doctoral scientists, graduate students, undergraduate scientists, K-12 educators and science enthusiasts.

The first speaker in the series will be a discussion on plant pathology by WSU post-doctoral research scientist Dr. Shashika Hewavitharana. Her talk, titled “Sustainable Soil-Borne Disease Management,” will present the research and data she completed for her doctoral dissertation last month. She will feature her work in disease management and agricultural practices.

For Hewavitharana, this work is very personal: “The majority of Sri Lankan farmers and their families suffer from chronic kidney failure disease due to excessive use of pesticides. With what I learned during my graduate studies in the U.S., I intend to return to my country and empower them with all the sustainable management tools that developing world is using to combat with yield and quality limiting crop diseases.”

Hewavitharana will begin field research with WSU Extension specialist Tianna Dupont and USDA ARS scientist Dr. Mark Mazzola.

Dr. Sue Kane is the director of the Apple STEM Network.

https://www.wenatcheeworld.com/news/local/community-connections-wenatchee-valley-college-math-students-partner-with-the/article_6994cb09-fe5b-5756-a17f-dedfb95e0448.html

Community Connections | Wenatchee Valley College math students partner with the Wenatchee police

By Holly Thorpe Sep 26, 2018



Wenatchee Valley College students pose with Capt. Edgar Reinfeld at the Wenatchee Police Department. From left, are Reinfeld, Lori Reyna, Eden Cazares, Steve Moses and Max Stevens. Not shown is Sara Aumell.

[Buy Now](#)

WENATCHEE — No werewolves. Put that on the next list of reasons to retire in Wenatchee. No provable werewolves, at least.

A group of student statisticians at Wenatchee Valley College is to thank for looking into the issue. The five students in Dr. Sai Ramaswamy's MATH 146 Statistics class were among dozens of other students who partnered with the Wenatchee Police Department last school year to look into 911 call data provided by the police.

The students — Max Stevens, Steve Moses, Lori Reyna, Eden Cazares and Sara Aumell — decided to investigate the correlation between animal-problem calls to 911 and the full moon.



"There was no correlation, which honestly, I was pretty upset about it," said Cazares, a 17-year-old Running Start student.

Capt. Edgar Reinfeld of the Wenatchee Police Department shared that disappointment. The effects of the full moon on people is a running joke and superstition among police, he said.

"We still fundamentally, anecdotally believe that the full moon makes a difference, even though it's probably complete garbage," he said

The partnership between the police department and Ramaswamy's students began in fall 2017.

For students like Stevens, 17, a Running Start student, the class was the first time putting his math and computer skills to use for a cause outside the classroom.

"It was exciting to know that I was actually helping someone out," Stevens said. "But it was also a huge responsibility. There was an extra burden on me to do it right."

Stevens' group was given date, time and call type information for a year — around 20,000 calls.

"My first reaction was 'Holy cow, that's a lot of data,'" Stevens said.

But he wanted more information. So, he wrote a computer script that pulled exact weather information for each call based on the time and date it was placed. That included phases of the moon, which led to their final project question. It took him four hours to write the script, which he'd never done before.

"Without knowing that the data we got would be used for some actual useful purpose, I don't think I would have written a script in the first place. I would have done something easier than that and just analyzed the data I already had," Stevens said. "I feel really humbled to have been able to do what I was able to do to help out the police department."

The experience finalized Stevens' decision to study computer science once he graduates from Wenatchee Valley College.

Reinfeld said that in the past year, the police department has been able to use the results of these students' projects in their work. One student group studied the use of the traffic circle at Cherry Street and Western Avenue.

The students observed hundreds of vehicles passing through the traffic circle and brought their conclusions to the department.

"We learned something valuable from that, that the only real problem with the traffic circle was people stopping in the traffic circle to let other people in," Reinfeld said. "We were able to know how to focus our public education efforts."

For the police department, it's not only useful for them, it's a way for them to connect with students and the larger community, Reinfeld said.

For Ramaswamy, program director for the bachelor of applied science in engineering-technology program at WVC, it gets students to see the use of math outside of the classroom.

"I wanted them to apply their classroom learning and at the same time help out their community," he said.

Holly Thorpe is a writer and editor for the community relations department at Wenatchee Valley College. Learn more about WVC at wvc.edu.

Karina R. Vega-Villa, Ph.D., is an Ecuadorian-American scientist, educator, and community leader. She earned a B.S. in Biological Sciences at the University of Idaho and a Ph.D. in Pharmaceutical Sciences from Washington State University. Currently, Karina is the Director of the Mathematics, Engineering, Science Achievement (MESA) Program and a faculty member at Wenatchee Valley College (WVC) teaching Biology and Chemistry. The MESA program is a nationally recognized academic development program that advocates for access, education, and equity in sciences and mathematics. MESA aims to diversify the science, technology, engineering, and mathematics (STEM) workforce and prepare a new generation of STEM leaders by addressing the challenges historically underrepresented students face in their educational and career development.

Prior to moving to Wenatchee, Karina worked at the University of Oklahoma Health Sciences Center (OUHSC) conducting medical research. Prior to her appointment at OUHSC, Karina was the Director of Operations for a natural products company on the East Coast for their South American division.

Karina serves on the board of several organizations including the Apple STEM Network and The Bridge Research & Innovation District. Karina is a School Board Director for the Wenatchee Schools District. She also serves in the STEM Education Innovation Alliance since July 2019.

Karina was a CASA volunteer from 2014 to 2019 and ensured that children in foster care receive adequate treatment and services. Karina has volunteered at her child's PTSA since 2016 as an advocate to make every child's potential a reality.

Karina, her husband, and their two children moved to Wenatchee in 2013. She enjoys reading, listening to podcasts, and spending time in our beautiful local parks.

Lens

Hydropower project “new frontier” for clean energy

By **TJ Martinell** June 27, 2019



The Chelan County PUD, Atlanta-based Southern Company and the U.S. Army Corps of Engineers have formed the Hydropower Research Institute to encourage data-sharing that promotes cost-savings and greater efficiency. Photo: freepik.com

A Senate bill approved this session by state lawmakers will require Washington state utilities to provide carbon-neutral energy by 2035 and to achieve 100 percent [clean energy](#) by 2045. While such policies rely on legal mandates and penalties for utilities that fail to comply, Chelan County Public Utility District (PUD) hopes to spur greater use of clean energy provided by hydropower through a new cooperative, data-sharing nonprofit. Those advancements may play an important role not only in keeping rates low, but also providing enough energy to maintain system reliability as Washington transitions away from coal and other carbon-producing energy sources.

“We recognize that hydro’s going to be relied (on) more and more in the clean energy future,” Chelan PUD Generation and Transmission Managing Director Kirk Hudson said. “How do we make it more reliable and more flexible so we can fill the gaps that are out there?”

Hudson is also the president of the [Hydropower Research Institute](#) (HRI), a paid membership-based nonprofit founded by the Chelan County PUD, Atlanta-based Southern Company and the U.S. Army Corps of Engineers (USACE). Altogether, the three handle 100 hydro plants and 30 percent of all hydropower-generated energy in the country.

“The producers are all cooperating and working together to [make sure](#) that those barriers to sharing data actually come down and benefits return to the producer,” Hudson said. “Each of those organizations have a different reason for really stepping out and saying we want to be a part of it. This is the way to do that, and at the same time we all benefit from more data than our own.”

With the Rocky Reach, Rock Island and Lake Chelan dams, Chelan County PUD [provides electricity](#) to three million customers. In April, the PUD [published a white paper](#) with the National Hydropower Association advocating, among other things, improvements to “hydro project performance,” one of several goals Hudson says HRI aims to achieve.

“There’s been a lot of improvements made in the hydro system over the years,” he said. “A lot of them have been focused on the machine design...to make them more efficient, to get more energy out of the same amount of water and to make them more fish-friendly.”

The idea for the institute first germinated in 2015 during the PUD’s strategic planning, Hudson said. “We recognized that...data analytics was likely the new frontier for hydro system improvements. We recognized right away the key is having large volumes of data and being able to manage that. We thought the best way to do it was to do it in coordination with hydropower owners, because it’s very expensive to do it ourselves, (and) we would only have access to our data.”

The PUD has since begun aggregating hydropower data with Southern Company, one of the [largest electricity producers](#) in the country with 4.68 million customers. Most of their energy is generated by natural gas (47 percent), with 14 percent from [renewable sources](#).

“They have a lot more plants...but they have similar challenges,” Hudson said.

The third founder is the USACE, the largest hydro operator in the country that manages 75 plants and generates approximately 25 percent of the nation's total hydropower. The federal agency's dams along the Columbia River in the Pacific Northwest generate 70 percent of its total power. While USACE owns and operates those hydro plants, the energy is marketed by the U.S. Department of Energy.

USACE Hydro Program Manager Daniel Rabon told Lens that for them, the institute offers a central hub to share data scattered throughout the agency. "What you currently have are about 75 islands of data sitting out there and are somewhat unavailable at a corporate or even regional level. We pulled in a couple pilot projects into HRI, and one of our projects had data all the way back to 2002, which is awesome, (but) it's all here on hard drives on the shelf, so it doesn't do us any good there. The HRI allows us to go across the corps, take these 75 islands of data, and put them into a common location but also with a common taxonomy."

While the USACE was previously collecting live hydro plant operational data, Rabon said "what we haven't done is...the aggregation of that data in a way that informs us more than just in the right now." The HRI is "a great example of where the industry saw a need and we were able to partner and do this."

Like Chelan PUD, another USACE goal is to improve daily operations as well as long-term capital investments such as turbine replacements that can take two years to order and install.

"It's really trying to get ahead of that," Rabon said. "If we have a generator fail tomorrow, (it's) six months to a year out of operation – could be longer depending on the damage. Had we...known that ahead of time...we would have been able to predict that and maybe get a repair contract in place to fix this ahead of time. It's really costly to federal hydropower whenever we have these unexpected outages."

Hudson said the PUD has already seen the potential cost-savings through this approach. After a machine-failure for one of the PUD's hydro facilities ended up costing \$1.5 million due to repairs and lost revenue from the forced outage, that information was shared with another utility provider. That [company](#) was then able to identify the same flaw in their machines and fix it before it failed. Because they were able to schedule the work in advance and at a time when system demand was low, it only cost them \$150,000.

Chelan County PUD and HRI External Affairs Director Tracy Yount told Lens that kind of foreknowledge can substantially reduce repair and maintenance costs moving forward. “It’s a lot different if you take a unit down during a peak demand period versus a time when we don’t have enough river water to operate the unit.”

Hudson added that “the better you can predict when failures might show up, the better you can plan for them and avoid the failure. If we know hydropower’s going to be relied (on) more and more in a clean energy future, how do we keep the machines up and running? We expect if we are better at analyzing the data coming from that instrumentation, we could see problems coming before they occur.”



TJ Martinell

TJ Martinell is a native Washingtonian and award-winning journalist. Born and raised in Bellevue, he’s been involved in the news industry since working at his [high school](#) newspaper. His investigative reporting for various community newspapers in the Puget Sound region has been recognized by the Washington Newspaper Publishers Association and the Society for Professional Journalists. A graduate of Eastern Washington University, he has a B.A. in journalism and was the news editor of EWU’s student university newspaper.

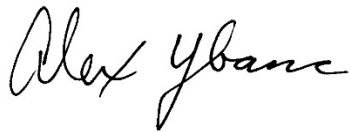
ALEX YBARRA

REPRESENTING THE 13TH DISTRICT

It's an honor to serve you in the state House of Representatives. Born and raised in Quincy, I know and love the people of the 13th District. Long before my arrival in Olympia, my thoughts have been focused on the needs of our communities. It's crucial we protect and grow the economy of our district. That's why water and agriculture are top priorities for me. We need to help, not hinder, our farmers. And, as a parent and long-time Quincy School Board member, I believe all of our children deserve an amply funded, quality education.

Along with fighting against higher taxes, as a strong conservative, I am an advocate for fiscally responsible and accountable state government. There are many challenges facing our state. I will do all I can to find solutions, while also remaining a strong voice for the values of our district.

Hearing from you helps me represent you more effectively in Olympia. My door is always open. Please feel free to contact me anytime with your comments, questions or concerns.

A handwritten signature in black ink that reads "Alex Ybarra". The signature is written in a cursive, flowing style.

Rep. Alex Ybarra
R-Quincy
(360) 786-7808 | alex.ybarra@leg.wa.gov

MIKE STEELE

REPRESENTING THE 12TH DISTRICT

It's an honor and privilege to represent the great people of North Central Washington. For more than 10 years I've served as the executive director for the Lake Chelan Chamber of Commerce, while also overseeing the company finances and payroll for our family's 112-year-old orchard business.

My legislative priorities include creating a more friendly business climate in 12th District and throughout the state. Our small businesses have a difficult time absorbing health insurance costs, burdensome regulations, and heavy B&O taxes. We need to do more to help employers sustain and create new jobs. It's also important that we strengthen our state's commitment to the tourism industry. Currently, we are the only state in the nation without a tourism agency. That needs to change.

I'm also committed to better policies for education, providing more health insurance options to create competition and prioritizing and the lowering costs of our transportation infrastructure.

As a state representative, it's my job to listen, help and be the voice for the people of the 12th District in Olympia. That's why your input is important. Please contact me if I can be of any assistance or if you have an idea or concern about a state government-related issue.

A handwritten signature in black ink, appearing to read "Mike Steele", with a long horizontal flourish extending to the right.

Rep. Mike Steele
R-Chelan
(360) 786-7832 | mike.steele@leg.wa.gov

Senator Brad Hawkins

12th Legislative District

Senator Brad Hawkins represents the 12th Legislative District, which includes all of Chelan and Douglas counties and portions of Okanogan and Grant counties. Brad was raised in the Wenatchee Valley and is proud to be serving his hometown community. He was elected to the Washington State Senate in 2016, and serves as a member of the Senate Republican leadership team.

Prior to his election to the Senate, Brad served four years as State Representative and a combined ten years on the North Central ESD and Eastmont school boards. Brad's favorite activity is spending quality time with his family but he also enjoys hiking throughout NCW, cycling on the loop trail, and early morning hot yoga. Brad and his Shawna have two boys and live in East Wenatchee.

During the 2019 Legislative Session, Senator Hawkins was the sponsor of Senate Bill 5588, which passed the Legislature unanimously and authorizes PUDs to produce, distribute, and sell renewable hydrogen. Senator Hawkins has also led efforts to support our local tree fruit industry, securing funding in the 2017-19 Operating Budget for the WSU Tree Fruit Research Center and is a recipient of the Washington State Tree Fruit Association's 2017 Legislative Champion Award.

Senator Hawkins' other key legislative efforts in the Senate include gaining approval for wildfire strategic planning and funding through passage of his Senate Bill 5546, funding for the West Cashmere Bridge in the transportation budget, and funding in recent capital budgets for a Saddle Rock trail project, Chelan County's Emergency Operation Center, and the Wenatchi Landing Sewer Extension.

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COVER STORY

Innovative to the **core**

By Reilly Kneeder

Business World staff writer

At this point, few people have seen it and even fewer have tasted it. But by next year there will be more than two million boxes of Cosmic Crisp apples on the market.

The variety is being promoted with a \$10 million marketing campaign featuring social media influencers, astronauts and chefs. The first seedlings were distributed using a drawing system, due to the high interest from growers.

A rollout of this scale is unprecedented in the apple industry — but so is this apple. A Washington State University tree fruit breeding program designed the variety nearly two decades ago by cross-pollinating Enterprise and Honeycrisp varieties.

Thanks to the advancements of the 21st century, agriculture is evolving. Packing lines now use infrared cameras, storage warehouses have robotic forklifts and, in the case of Cosmic,

even the fruit itself is an innovation.

It's left the industry more automated and more efficient, but also more consolidated.

"Yes, agriculture is probably the oldest industry in human civilization," said Jon DeVaney, president of the Washington State Tree Fruit Association. "... But just because it's the oldest industry, does not mean agriculture is exempt from pressures other industries face: to be more efficient, to stay at the cutting edge of new development, and to always increase productivity while decreasing the amount of resources needed."

Agriculture at the speed of automation

The heart of Stemilt Growers' new distribution center is kept cool, just over 30 degrees, to help preserve the fruit. It's also dark, because the robots don't need light the way their human counterparts do.

This is Stemilt's Automated Storage and Retrieval System, or ASRS, — a hive of automated carrying machines that pluck pallets of fruit from towering storage racks before they're shipped around the world.

The 478,089-square-foot distribution center was conceived after the 2015 Sleepy Hollow Fire destroyed one of the company's shipping centers in Wenatchee.

All Stemilt produce leaving Wenatchee is now routed through the one facility, which was completed next to the company's Olds Station headquarters in June 2018.

"The distribution center was always a vision of the Mathison family, who owns Stemilt. But it never would have been made a reality without that fire," said Stemilt spokeswoman Brianna Shales. "The opportunity that came out of that destruction was the ability to have a consolidated shipping facility and operations."

The company has two cherry packing lines and one apple packing line in a neighboring packing shed on its Olds Station campus. Once packed, boxes of fruit travel across an elevated, cooled conveyor belt into the distribution center.

The boxes are stacked onto pallets and secured by large plastic wrap-wielding robots. Each pallet must be precisely stacked and wrapped before entering the ASRS.

The five-level ASRS can store 12,770 pallets at any given



Business World photos/Don Seabrook

In a cold storage area they call the "Cube", an automated retrieval robot brings a pallet of boxed fruit down from one of five levels to a shipping area late last month. It's part of Stemilt Growers' new Automated Storage and Retrieval System.



The Cosmic Crisp apple was developed by a WSU tree breeding program in 1997. More than two million boxes of them will be available to consumers by the end of this year.



Using an imaging system to sort fruit, cherries are blown off their small trays into specific areas of McDougall & Sons' packaging area in Baker Flats last month.

COVER STORY



The Cosmic Crisp variety of apple originated from this mother tree, alone and still growing at a Washington State University Tree Fruit Research and Extension Center between East Wenatchee and Orondo.

time. The facility also has a conventional storage area — with human workers tending to the stacks — that can store another 4,122 pallets.

When an order of fruit needs to go out, the automated carrying machines pull down the needed pallets and arrange them for a human-operated forklift to load into a waiting truck. The facility has 22 truck loading bays with room to expand.

The whole system is designed to make a notoriously complicated part of the fruit production system faster and more efficient, Shales said.

“Before, a truck might have to go to two facilities to get fully loaded. Now they’re coming to one,” she said. “And they’re also getting out much quicker because we’re relying on automation to be able to set up the majority of the order and the forklift to finish it off.”

The goal is to have a truck leave within an hour of checking in, she said. The efficiency has also allowed Stemilt to reduce shipping staff hours, Shales said, “which is a huge benefit.”

But even when the crews go home at night, the ASRS is still hard at work, rotating and organizing the pallets to prepare for the next day.

Better than pencil and paper

The cherries go by in a flash, too fast for the eye to keep up. But the Cherry Vision 3.0 has already analyzed each cherry’s size, color and any potential defects.

The optical sorting system, made by Italian company Unitec, represents one of the fastest-advancing areas in agriculture: the packing line.

“When you have a controlled environment in a warehouse, it’s more easy to automate,” said DeVaney, the Washington State Tree Fruit Association president. “It’s easier to scan a piece of fruit running across a line than it is to scan it on a tree when it may be behind leaves or branches and you’re outside. There are opportunities in the orchard, but we’re seeing those technologies applied first in the packing house.”

The agriculture industry is expanding and the available labor force is having a hard time keeping up, DeVaney said. Automating some areas of the production



Washington State University Tree Fruit Research and Extension Center Research Technician Lisa Brutcher thins apples from a tree in a WSU 7 parent block in an orchard between East Wenatchee and Orondo.

process has helped relieve that pressure.

“It reduces the amount of labor needed to move fruit. But it’s not that we’ve seen a decrease in the total number of employees in the industry, we’ve just seen a big increase in the amount of productivity that we can get out of the labor force that we have,” he said.

And these computerized packing lines are now producing something almost as valuable as the fruit: data.

“It’s exciting how much can be done with this new technology. Not just with production, how much volume individual packing houses can handle with these new lines, but how we’re able to improve quality control and generate data,” DeVaney said. “The warehouses and sales houses can have a better handle on their product. And they can give that feedback to the growers to make sure they are producing a product that is going to give them the best returns.”

Business World photos/Don Seabrook

COVER STORY

With the data in hand, producers can adjust tree nutrition or track production volume from year to year, DeVaney said.

“They can really identify trends and fix problems in ways that are harder to do when it’s just with the human brain and a pencil after the fact,” he said.

The power of a pencil eraser

The Cosmic Crisp mother tree was planted in 2001 at the end of a row in a quiet orchard in Orondo. It’s still there, albeit a little overgrown, and still producing fruit.

“It was the last tree in the row, so it was easy to save,” said Bonnie Schonberg, a research tech at WSU. “Otherwise, in convenience, it would have been easy to pull.”

Cosmic Crisp is just one of the thousands of specimens developed by the university’s breeding program since it was started in 1994.

“You can think of (the program) like a conveyor belt of material that keeps progressing,” said Kate Evans, the program’s director. “Plant breeding starts with us deciding what targets we want in our finished variety. Here, we’re looking for varieties that will grow in the apple-producing areas of Washington and are available to growers in Washington.”

Using a pencil eraser, pollen from one of the parent trees is transferred onto the stigma of another, creating a new variety.

“It takes us about 18 years to get from that point to the point where we’ve tested and selected,” Evans said. “... Every year we’re making those new crosses so every year we’re introducing new material into the program and every year everything else shifts a little further down the conveyor belt to whether it’s going to be good enough to be released or not.”

Those years of testing are for both the tree and its apple. They’re looking for qualities that’ll make it successful on a mass scale: How well does it grow? How well does it store? Can it go over a packing line? And how does the fruit look and taste?

Since the programs started in 1994, only two varieties have passed through this gauntlet all the way: Sunrise Magic in 2009 and Cosmic Crisp.

Due to high interest in Cosmic Crisp, a drawing was



Cherries packed in clam shells move along a conveyor highway to be shipped to destinations around the world at Stemilt Growers’ new shipping facility north of Wenatchee.

held the first year to determine which growers got to plant the first seedlings.

And that’s important, because agriculture innovations aren’t always available to the masses, DeVaney said.

“They have a significant cost associated with them,” he said. “We have been seeing a 100-year-long trend of consolidation of the industry. Because as it gets bigger, the cost of investment is significant.”

The number of orchard operations in Chelan County went from 1,126 in 1997 to 622 in 2017, according to a U.S.

Department of Agriculture census released in April. Total sales from fruit and tree nut operations went up from \$150 million to \$254 million in the same timeframe.

But there are companies and research groups working on making the innovation more equitable and available, just like Cosmic Crisp, DeVaney said.

“Every grower in the state gets a chance to plant that variety,” he said. “Balancing technological innovation with access and affordability is something our industry is constantly working on.”

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BRIEF BIOSKETCH

James R McFerson

Jim McFerson is now retired from his previous position as Director of the WSU Tree Fruit Research and Extension Center in Wenatchee, WA, after four years of service. Prior to that he served as Manager of the Washington Tree Fruit Research Commission. He holds a PhD in Plant breeding and Genetics from the University of Wisconsin-Madison and has led research programs in plant breeding and horticultural management of vegetables and tree fruits in the public and private sectors.

He played a principal role in the development and implementation of the Tree Fruit Technology Roadmap, a national effort to improve the productivity, efficiency, safety and sustainability of tree fruit production and handling, with an emphasis on a systems approach to genetic, horticultural and engineering-based solutions. He is a member of the National Genetic Resources Advisory Council, which advises the USDA on policy issues associated with genetic resources. He is also a member of three USDA Crop Advisory Committees, working with our national germplasm collections of *Malus*, (apple), *Pyrus* (pear) and *Prunus* (apricot, cherry, peach, plum). He is an active member of the Our Valley Our Future working group on the BRIDGE initiative, which seeks to establish a research and innovation district for the greater Wenatchee area.

In These Rural Schools, the Computer Science Teachers Are Volunteers Who Work for Microsoft, Amazon and Google.

That's Opening Doors for Their Students

By **Kate Stringer** | May 6, 2019

Gonzalo Birrueta didn't just like [playing video games](#) as a kid; he liked thinking about how they were made. In middle school, he'd experiment with coding, watching YouTube videos for help. But it was easy to lose motivation — he didn't have many people he could talk to about coding in Quincy, a rural town of 7,000 perched above the Columbia River in Central Washington state.

Computer science offerings have grown over the past 10 years, but rigorous courses can be hard to come by, especially in rural areas. While 58 percent of rural schools [report](#) teaching some type of computer science class, less than half of those actually teach coding, and only 8 percent offer an Advanced Placement option.

But when Birrueta arrived at Quincy High School, he had several computer science classes waiting for him. Quincy had just partnered with [TEALS](#), a free program run by [Microsoft](#) Philanthropies that trains tech industry employees to teach computer science lessons in partnership with classroom teachers.

The TEALS model addresses one of the largest barriers [school leaders cite](#) to being able to teach computer science: finding experienced teachers. After TEALS volunteers co-teach with classroom educators over the course of several years, those teachers feel confident enough to lead computer science classes on their own.

Now 10 years old, TEALS (Technology Education and Literacy in Schools) reached nearly 500 schools this academic year across 27 states, D.C., and British Columbia, or 15,500 students. Its more than 1,400 volunteer teachers hail from hundreds of tech companies, including Microsoft, Google, Facebook and Amazon. Several volunteers partner with one school where they alternate teaching each day for an hour in the morning before heading to work.

But because most tech industry employees live in large cities, TEALS had to rethink how to deliver instruction to students in rural schools. For these students, TEALS instructors teach lessons over video conferencing, wherein students can chat back and forth with their teacher. For example, an Amazon employee based in Seattle teaches Birrueta's class in Quincy every morning at 8:05 a.m. before he starts work at 10.

"We want to make sure that kids in rural areas, just because they're born in a different zip code, get the same opportunities as kids in other areas," said Kevin Wang, TEALS founder and a former Microsoft engineer.



Microsoft TEALS leader Kevin Wang (right) talks to Zack Reynolds and Jayr Gudino, Quincy High School seniors who took AP Computer Science through TEALS. (Microsoft)

And students like Birrueta, now a senior, say the program has made an impact on their lives, introducing them to new careers, new cities and new ways of thinking.

“Not only does computer science teach you the technical things, it teaches you to problem-solve in real life as well as think more critically,” Birrueta said. “I do think it should become a requirement to at least take an intro class to get exposure and to know that it’s there.”

A rural school with a computer science track

Lee County High School in Beattyville, Kentucky, was one of the first rural schools to sign up for the program in 2012. It’s now considered a TEALS alumni school, meaning that the classroom teacher runs the TEALS program without the help of volunteers. Since the TEALS partnership, Lee County High School has transformed, hiring a full-time teacher dedicated to computer science and creating a career track for students in computer science so they can take multiple classes over four years. About 65 students, or 20 percent of the student body, take computer science classes.

“It’s one of the best career pathways we’ve been able to provide our kids,” district Superintendent Jim Evans said.

TEALS bases its introductory [course](#) on UC Berkeley’s class called “The Beauty and Joy of Computing,” while its AP Computer Science A class is based on University of Washington’s intro class.

Adrienne Roberts, a senior at the high school, is now taking her fifth computer science course. She’s working on a project right now that involves using multiple coding languages to create a tourism website for her town. While she doesn’t know if she’ll pursue computer science as a career, she likes how useful it will be for most jobs.

“You have to think in a different way than you do in other classes,” Roberts said.

“There are so many different ways to solve a problem. It’s interesting to see how other people do it compared to how I do it.”

Giving students the opportunity to take these classes while in high school lets them discover their interests earlier or find out if the subject is not for them, computer science teacher Joy Neace said.



Joy Neace, a Lee County Public Schools computer science teacher, helps her students with a coding assignment. (Microsoft)

“It allows students to know, ‘This might be for me,’ or, ‘Hey, I can save money and not take these classes,’” she said.

The district had to be very active in applying for grants to help fund [computers](#) and infrastructure, said William Owens, chair of the Lee County school board. He said the community has been supportive of the new computer science courses, and only occasionally does he hear concerns about brain drain, or the idea that students will permanently leave the community to go use their new skills in city tech hubs. The

county's top three employers are the Lee Memorial Health System, the school district and Publix supermarket.

"We've had several kids who have gotten decent jobs through the program, and I'm just supportive of anything that helps the kids," Owens said.

Wang said that when he hears concerns from the community about brain drain, he points out some of the tech needs community members might not know they have, from farms that are looking for software engineers to run their technological agriculture needs to local businesses that are trying to grow. TEALS is also working with Microsoft's TechSpark, a program that is trying to help businesses in small towns use digital tools to help reinvent and expand their local industries.

'Extreme volunteering'

It was a little weird at first. That's how most students in rural schools described the experience of having their computer science teacher projected onto a screen. But after awhile, they got used to it, and many said they began to see the volunteers not just as teachers but as mentors.



Adam Sampson, TEALS volunteer and WordRake employee, teaches students at Quincy High School over a video conferencing call. (Mark Kondo)

Wang calls the volunteers' work "extreme volunteering," for the nearly 200 hours they commit to their students over the course of the school year. They also go through 40 hours of training before they're placed in the classroom, where they learn everything from how to break down problems with high school students to making lessons fun and relevant. The volunteers and classroom teacher also meet to decide how they're going to co-teach and plan lessons.

Matt McKee, a software engineer at Amazon, volunteer teaches at Quincy High School. While most TEALS volunteers work a few days a week, McKee teaches every morning. McKee said he is motivated to give back because of all the mentors he had growing up who introduced him to computer science.

“I love the program, I love working with the students, and I love the impact you make on the school,” McKee said. “The students are fantastic too. Every year I’ve had incredible students who tackle hard challenges and don’t hesitate to dive into the material.”

Zack Reynolds, also a senior at Quincy High, credits all of his teachers as having a meaningful impact on his computer science trajectory. Reynolds has built his own programs to help him study for other classes like Spanish and math. His classroom teacher, Mark Kondo, said Reynolds comes early to computer science class just to read a textbook on Java, which he jokingly refers to as the Bible. Reynolds and his classmate Jayr Gudino each earned a spot last summer at Carnegie Mellon University’s highly competitive coding camp. McKee traveled with the students on their first airplane trip to Pittsburgh to help them get settled, and Microsoft funded the experience for both students.

For rural schools that have a large low-income population, other circumstances can compete with a program like TEALS. Some students don’t have internet [access](#) or laptops at home, which means in some classes, teachers have to be mindful not to give assignments that require significant homework. Students at Quincy High School take field trips to the Seattle area for TEALS conferences, but some of their peers can’t attend because they are expected to take care of siblings at home.



Students sit outside Quincy High School, a school in rural Washington that's adopted the TEALS program. (Microsoft)

Mark Kondo, the classroom teacher at Quincy, has been moved by the attentiveness and generosity of the TEALS volunteers to student needs. Some bought laptops for the students that they could check out of the classroom and take home to practice coding. The volunteers also travel the 160 miles from Seattle to Quincy about once a quarter to meet the students in person.

“We’re remote and rural, so for [my students] to interact with software engineers is something they would never do if not for TEALS,” Kondo said. “It opens up their eyes to the world.”

Having teachers who also work daily in the tech industry gives students connections to careers. Birrueta learned about the [Make School](#) in San Francisco, a school that gives hands-on computer science training to students, from one of the volunteers. That inspired him to spend a year saving his money from packaging apples so he could attend their summer computer science program in the Bay Area. Now a senior about to graduate, Birrueta plans to return and earn a bachelor’s degree in computer science to become an engineer.

TEALS has even seen some of its former students become volunteer teachers.

Nathalia Scrimshaw went from being a TEALS student in Bellevue, Washington, to now working as a TEALS volunteer for Chelan High School in Central Washington in addition to her full-time job as a program manager in Microsoft's Xbox division.

Scrimshaw said the TEALS curriculum is adaptive to both the changing technology landscape and the diverse group of students it serves. Scrimshaw participated in a TEALS training over the summer about culturally responsive teaching and was able to put her Spanish language skills to use in the classroom to better connect with her students who were learning English.

"For me, it was about giving back to the community," Scrimshaw said. "If I hadn't had TEALS in my own life, I wouldn't be where I am today."

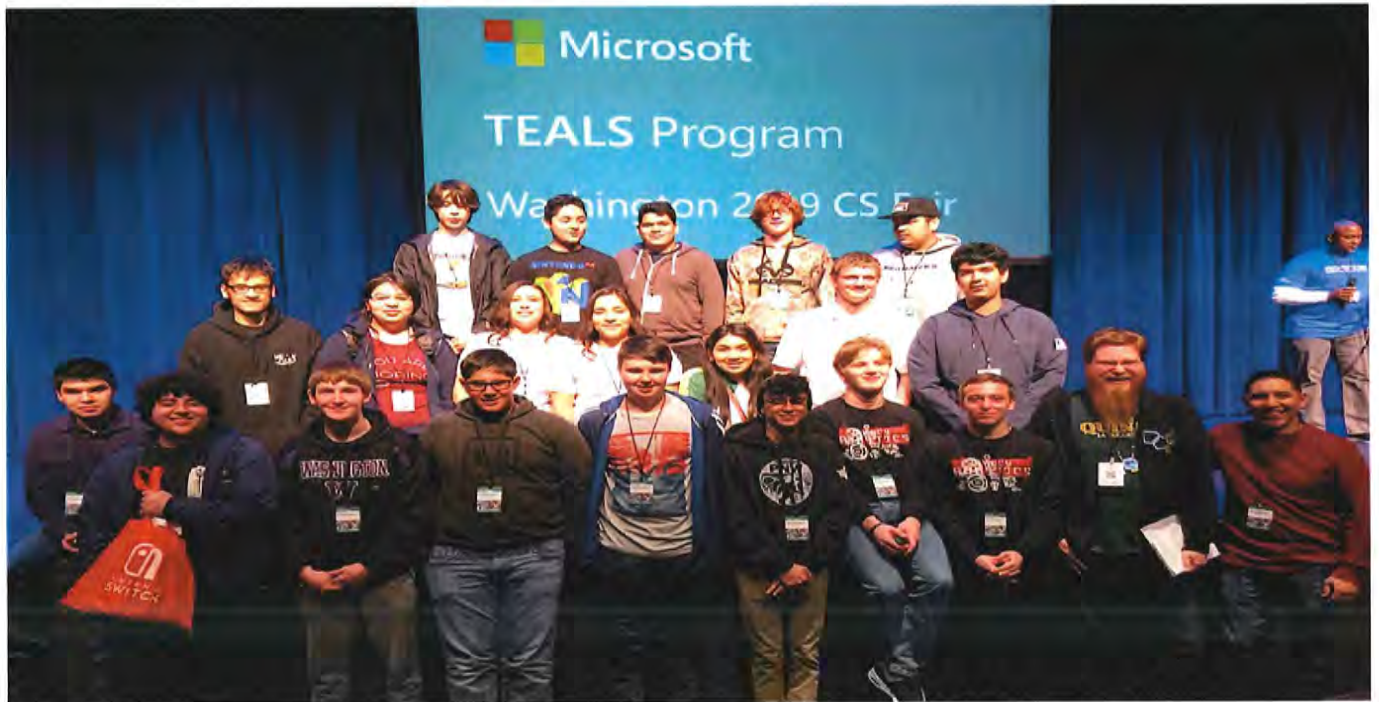
Computer science is for everyone

Christian Rivera first became interested in how computers work during a year when he lived in Mexico. The only access he had to a computer was the one at the local [coffee shop](#), which was consistently broken. If you want to use it, you have to fix it, the store owner said, and eventually, at age 13, Rivera did.

Even after that, Rivera didn't have much experience with coding before he started high school and began taking TEALS courses at Quincy, but he said he wanted to challenge himself.

"When I started taking the class, the TEALS teachers started explaining to us that computer science is the future ... so that pushed me to try my best," Rivera said.

Schools across the country also acknowledge this future — nearly 750 applied to be part of the TEALS program for this next academic year, though only 600 will be able to participate. Expanding the program often depends upon the availability of volunteers.



Students from Quincy High School at the 2019 TEALS Fair in Bellevue, Washington. (Mark Kondo)

As TEALS grows, Wang hopes to spread the program to more rural schools. Right now about 20 percent of schools that participate are rural (or 89 schools), though Wang hopes to increase that to 25 percent soon. In the U.S., 28 percent of all U.S. schools are [classified](#) as rural, according to the most recent [federal data](#). They also want to ensure a more equal gender balance. Currently 34 percent of TEALS students are female, an increase from 25 percent four years ago.

The students are advocates for getting more of their peers involved as well. Rivera and Birrueta both say computer science is for everyone, not just the kids who are viewed as good at math and science. When the classes get tough, Rivera recalled some advice his volunteer TEALS teacher passed on to him.

“Just because the code doesn’t work, doesn’t mean it’s completely wrong,” his teacher told him. “She then told us, ‘Just because it doesn’t work doesn’t mean you should stop trying. It’s not wrong to make mistakes, because that’s what life is.’”

Lead image: Former students Hannah Gonzalez and Juan Zetina at Quincy High School took computer sciences classes, thanks to the TEALS program (Microsoft)

Number of Female Students, Students of Color Tackling Computer Science AP on the Rise

- By Dian Schaffhauser – August 19, 2019

The [College Board](#) has released some preliminary data on the [Advanced Placement Computer Science Principles](#) assessment for 2019. Three years after the launch of the course and its exam, according to the nonprofit, participation has more than doubled. Over the same period, the number of female students and students of color tackling AP CSP also more than doubled. The total number of students who took the AP CSP exam in 2019 was 96,105.

In the three years since its launch, the number of female students participating in AP CSP has increased 136 percent, from 13,328 to 31,458. The number of those students getting a passing score of 3 or higher has risen 133 percent since 2016-2017.

The number of black/African American students participating in AP CSP is also on the rise, increasing 121 percent since the course launched, from 2,981 to 6,589 in 2019. The number of black/African American students who scored a 3 or higher has increased 118 percent since 2016-2017.

Among Latinx students, participation in AP CSP rose 125 percent, from 8,334 to 18,780, over the three-year period, and the number of those achieving a passing score increased 116 percent.

The College Board said that AP CSP participation has also boosted the number of students studying computer science and persisting in CS in high school when it's available. Those who tackle the AP CSP exam were also almost six times more likely to take [Computer Science A](#), the other AP CS course, compared to other AP STEM examinees, and about 15 times more likely than non-AP STEM examinees.

"We need more students ready to shape technology, not just cope with it," said Stefanie Sanford, the College Board chief of global policy and external relations, in a statement. "AP Computer Science Principles is inviting a broader, more diverse set of students to master technology and write the code of the future."

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Gene Sharratt and Sue Kane | A prosperous economy requires creating a STEM-related skilled and educated workforce

By Dr. Gene Sharratt and Dr. Sue Kane

Washington State's STEM Education Innovation Alliance May 13, 2019

A skilled and educated workforce is essential to a vibrant and prosperous economy in the Wenatchee area and across Washington. Our state is fortunate to have a dynamic economy driven by a growing number of innovative employers and a flourishing tech sector. Throughout North Central Washington, the healthcare, education, agriculture and hydro-power energy sectors of our economy depend on a skilled and educated workforce.

Washington has been ranked No. 1 for business, with the nation's fastest-growing economy, No. 2 in the concentration of STEM (Science, Technology, Engineering, and Mathematics) jobs, number three in STEM job growth and among the top states in technology innovation and the percentage of workforce in tech industries.

Locally, in 2018 the Milken Institute ranked Wenatchee 15th in the overall top 200 Best Performing Cities report which considers factors like: job growth, wage growth, and high-tech growth in the rankings. Wenatchee ranked number four in terms of "high-tech" GDP growth.

Nationally, U.S. employers continue to create jobs, as well. The Labor Department recently reported that job openings jumped 2.4 percent in December 2018 to 7.3 million — the most since records began in December 2000. Employers added 304,000 jobs in December 2018, the most in a single month in nearly a year. Outside of our state, the country continues to experience job growth, creating competition for our companies for a skilled and educated workforce.

Within our state, our economy is thriving with 740,000 projected job openings in the coming years. The majority of these jobs will be in STEM-related occupations requiring post-secondary education and training.

However, statewide data masks a complex regional narrative in which prosperity is spread unevenly, and some communities — including many in rural areas — are outright struggling. Across the state, communities need infrastructure, workforce talent, a policy climate that supports innovation, and investments in multiple STEM education pathways.

With multiple pathways to these STEM jobs — post-secondary certification programs, two-year technical degrees and four-year university degrees — our young people will be poised to lead the way for the nation in fields as varied as clean energy, computer science, engineering, advanced manufacturing, agriculture and natural resources, horticulture, health care and medical research.

Unfortunately, Washington trails most states in establishing a culture that promotes — an education pipeline that supports — post-secondary education and training for all students. Only an estimated 40 percent of Washington high school students go on to attain a post-

secondary credential by age 26. Washington currently ranks 42nd in the nation for degree attainment, putting our students, businesses and communities at risk of falling behind.

The market demand for a skilled and an educated workforce far exceeds our state's ability to produce the workforce needed for current and projected jobs. Washington continually ranks toward the top of the list of states that import talent from other states to fill jobs.

To ensure that our youth and adults are prepared to compete for exciting new careers in this STEM-driven economy, it is imperative that we expand and improve STEM education and career-connected learning opportunities from birth through post-secondary education, as well as through innovative retraining programs for adults who left the education system before completing a high school diploma or post-secondary credential.

Our state is making progress in preparing students for success in Washington jobs. But major gaps exist that we must fix if we are to meet workforce demands. Here are some areas of progress and where growth is needed:

Alignment of STEM Education Programs with Workforce Demand

We have made progress in raising the number of Washington higher education graduates earning degrees in STEM fields, but the percentage is still too low to meet workforce needs. More than one-fourth (28 percent) of bachelor's degrees awarded at Washington public schools and private institutions in 2017 were in STEM subjects, up from 22 percent in 2012. STEM degree and long-term certificate completions have shown steady increases in recent years (2013-17).

- ◆ Two-year degree and certificate completions in STEM fields increased by more than 14 percent.
- ◆ Four-year degree completions in computer and information science grew by 70 percent, in engineering by 4 percent, and in health care by 26 percent.
- ◆ Graduate degree and certificate completions in computer and information science grew by 87 percent, in engineering by 41 percent, and in health care by 13 percent.

However, many STEM programs remain highly selective and limited enrollment capacity remains a barrier in some fields, particularly in computer science. The rapidly growing workforce demand is still outpacing STEM degree production.

- ◆ In computer science, out of a total of more than 9,000 annual job openings, there will be nearly 6,000 more openings than there are graduates completing degree programs prepared to take them.
- ◆ In engineering, out of a total of about 2,500 annual job openings, there will be more than 400 more openings than there are graduates prepared to fill them.
- ◆ In health care, out of a total of more than 11,000 annual job openings, there will be nearly 1,400 more openings than there are graduates prepared to fill them.

Underrepresented Populations Continue to Face Challenges in STEM

A gender imbalance in STEM achievement tends to widen as students move through the pipeline.

- ◆ Among pre-K students, girls tend to do as well as boys in math, with about 66 percent demonstrating “kindergarten readiness” in the 2017-18 WaKIDS assessment.
- ◆ As they advance in their education, however, interest and achievement in key STEM subjects tends to fade for female students. In 2018, only 46 percent of students completing AP calculus exams and 27 percent of students completing AP computer science exams were female.

- ◆ Male students also complete STEM degrees in greater numbers than female students. In 2017, only 35 percent of students completing associate degrees or bachelor’s degrees in STEM were female and only 22 percent completed degrees in computer science.

Students from low-income and minority families are disadvantaged at all stages in the STEM pipeline

- ◆ Among low-income pre-K students, only 50 percent demonstrated “kindergarten readiness” in math in 2017-18.
- ◆ Smarter balanced math scores for low-income and underrepresented minority students are low compared to other groups. Among low-income students, only 42 percent of 3rd graders, 32 percent of 5th graders, and 30 percent of 8th graders met the standard in 2018. The percentages are even lower for Hispanic/Latino and Black/African American students.

◆ AP exam pass rates in key STEM subjects are also low for underserved minority students. In 2018 only 49 percent of Hispanic/Latino students and 44 percent of Black/African American students passed AP calculus exams.

Solutions to prepare all Washington students for success in the Washington Economy

From the Pacific Coast to Eastern Washington, our economy is rooted in innovation. We employ more than 9 percent of the state's total workforce in the STEM sector. Of Washington's top 25 occupations in 2018 11 were STEM-related and comprise more than half (approximately 28,000) of the nearly 48,000 open jobs across the state.

It is clear that many Washingtonians are not on a path to participate in our growing economy. To achieve an innovative and dynamic workforce, and to address gaps between degree production and employer demand in key fields, we recommend the following actionable goals:

- ◆ Inspire youth through career connected and real-world STEM learning opportunities (Career-Connected Learning). These opportunities expand learning from kindergarten to postsecondary education and provide students and young people direct experience with existing and emerging STEM industries, jobs and careers.
- ◆ Provide every K-12 student equitable access to computer science education. In North Central Washington, the North Central Educational Service District, in partnership with the Microsoft TEALS program, is leading an effort to increase the number of school districts offering computer science. Since 2017, this opportunity increased the number of participating schools

from 11 to 18. The Apple STEM Network is currently working to align pathways for rural students that will improve their transition to Wenatchee Valley and Big Bend Colleges and Central Washington University.

- ◆ Prepare Washington's future workforce by increasing attainment of technical credentials, apprenticeships, two- and four-year degrees.
- ◆ Improve equity by implementing interventions to close educational opportunity gaps from cradle to career, providing world-class preparation and support for STEM teachers, and improving workforce diversity.
- ◆ Maintain the state's commitment to rigorous learning standards, assessments, and high school graduation requirements.
- ◆ Ensure Washington's youngest learners enter school ready to learn and excel, with a focus on the state's investment in high-quality early learning options for low-income students, with the intent of fully funding the state's Early Childhood Education and Assistance Program by 2022-23.
- ◆ Expand early learning math literacy programs. Research shows children's interest and enthusiasm for math begins long before kindergarten. The best time to cultivate confidence in math is during these early years. STEM Networks across the state are participating in the Washington Early Math Coalition, working to identify resources and systems supporting early math learning, as well as high-leverage opportunities where new investments would yield the largest return on investment for children and families.
- ◆ Champion the State Need Grant (Washington Promise Scholarship). This crucial support for the state's low-income undergraduate students who are pursuing degrees or retraining and gaining credentials for careers is necessary to promote equitable access and opportunity to STEM education in Washington.

The future is bright for our local economy and state, but only if we invest in our students, from pre-K through postsecondary education, in STEM-literacy and in their preparation to engage in the skilled and educated workforce. A postsecondary credential is the single most reliable path to economic success for individuals, as well as to the prosperity of communities and of our state.

Technology continues to alter the workforce and educational landscape. Whether it be virtual reality, coding language, drone technology, or 3D printing, a postsecondary credential provides the education and experience necessary for a skilled and educated workforce — and the success of our students.

The need to build a regional and statewide strategic vision focused on industries with the capacity to stimulate sustained growth and prosperity is imperative. Creating a skilled and educated workforce is crucial to achieving this vision. Regions that better link education and training programs to workforce needs of employers will attract and retain businesses and create more opportunities for residents to engage and prosper in the new knowledge and innovation-based economy.

Dr. Gene Sharratt co-chairs Washington State's STEM Education Innovation Alliance. In addition, he is the Executive Director for the OSPI/AESD Professional Learning Network, and a member of the College Promise Coalition. Dr. Sue Kane is Co-Director of the Apple STEM Network and a member of the STEM Education Innovation Alliance.



September 26, 2019

FOR IMMEDIATE RELEASE

Contact: Jenny Rojanasthien, Executive Director, 509-661-9000

INNOVATOR AWARD WINNERS ANNOUNCED AT GWATA LUNCHEON

WENATCHEE, WA – GWATA hosted the 19th Annual Innovator Awards Luncheon at the Wenatchee Convention Center on September 25, 2019. During the event, innovators from North Central Washington received awards in five categories:

- Jeff Soehren, Blue Spirits Distilling (Entrepreneur of the Year)
- Jeff Berry; FocusGeo (Innovative Use of Technology in Business)
- Debbie Gallaher and Bob Bauer; Chelan County PUD (STEM Champion of the Year)
- Amanda Jeffries; Wenatchee Valley College (STEM College Student Innovator of the Year)
- Galactic Farmers; ACH Middle School (Future Technology Leader of the Year)

The Innovator Awards Luncheon celebrates the drive, passion, and spirit of innovators in North Central Washington while inspiring those who are just starting their journey. Over 360 attendees came out to celebrate and recognize the nominees, finalists, and hear the live announcement of the winners.

The 2019 Innovator Award Winners were among 31 individuals/organizations who were nominated by the community for their innovation and accomplishments in entrepreneurship, technology, or education.

Peoples Bank presented the **Entrepreneur of the Year Award to Jeff Soehren**, founder of Blue Spirits Distilling. Blue Spirits Distilling started in Chelan and produces 13 unique profiles for gin, whiskey, vodka, rum, and tequila. They have expanded production to Cashmere to add bespoke whiskey, including Rye, Bourbon and a Bavarian style Single Malt. Blue Spirits products are distributed and available for retail purchase at two locations in Leavenworth. For more information visit www.bluespiritsdistilling.com

Stemilt Growers presented the **Innovative Use of Technology in Business Award to FocusGeo**. FocusGeo is geospatial services company specializing in 3D Mapping, Aerial Imaging, and Geographic Information Systems (GIS). Using Unmanned Aerial Systems along with terrestrial and vehicle mounted LiDAR and imaging systems FocusGeo provides precision mapping services to support surveyors, engineers, and public agencies. For more information visit www.focusgeo.net

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Microsoft presented the **STEM Champion of the Year Award to Debbie Gallaher and Bob Bauer** from the Rocky Reach Discovery Center at Chelan County PUD. Bob and Debbie oversee a multitude of STEM related education experiences for students and learners of all ages. This is accomplished through several community and school district partnerships that allow nearly 2,000 students annually to participate in STEM education experiences at Rocky Reach Dam. Their goal is be a community partner that brings industry and education together to provide a host of high quality STEM experiences for students in our valley. One of their many STEM projects, The FWEE Hydropower and STEM Career Academy was honored to receive from the National Hydro Association the 'Outstanding Stewards of America's Water' award.

Apple STEM Network presented the **STEM College Student Innovator of the Year to Amanda Jeffries** from Wenatchee Valley College. In the winter quarter of 2019, Amanda had the opportunity to work on Course Based Research for Undergraduates in her microbiology class. Amanda researched antibiotic resistant bacteria in the environment. This project solidified her passion for research and the drive to help others succeed in the STEM. In order to help support and encourage other STEM students, Amanda is launching the first STEM Club at Wenatchee Valley College. The club is designed to support STEM students through focused study groups as well as foster community involvement by providing unique and innovative volunteer opportunities to the students.

Equilus Capital Partners, LLC presented the **Future Technology Leader Award to The Galactic Farmers** from Almira, Coulee, Hartline Middle School. The six person student team includes: Kayleigh Elder, Christine Keeley, Nathan Hinkle, Beth Okamoto, Max Horrell, and Kady Murray. The Galactic Farmers, representing ACH Middle School and communities, participated in the 2019 Northwest Earth and Space Sciences Pipeline's ANGLEs Challenge (Apollo Next Giant Leap Student Challenge). The competition included flying a drone to accuracy, building a lunar model to land on the moon with appropriate scale, building and programming an EV3 (LEGO) robot constructing and moving a "payload" to a targeted location, identifying a moon rock sample and returning it to base, avoiding craters throughout movements. Each challenge component reflected the students' agricultural community and culture. This challenge pushed students out of comfort zones and into new STEM skills.

In addition to the awards, the winners in each education category received a scholarship prize to go towards their continuing education or fund special projects. Thanks to the community's donations, GWATA awarded \$3,690 in scholarship money.

GWATA would like to thank the presenting sponsors of the 2019 Innovator Awards luncheon: Equilus Capital Partners, Microsoft, Peoples Bank, and Stemilt Growers. GWATA would also like to recognize supporting partners at Cordell Neher & Co, Subsplash, Van Doren Sales, Confluence Health, Molina Healthcare, Cashmere Valley Bank, Key Methods, LocalTel Communications, Cherry Creek Radio, Native Network, and Chelan County PUD.

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Additional Information

More information on all of the nominees, finalists, and award recipients can be found on the GWATA Website. www.gwata.org/innovators

GWATA has produced videos on the Innovator Awards Winners which you can find on the [GWATA YouTube](#) or website.

About GWATA

Since 1999, GWATA (the Greater Wenatchee Area Technology Alliance) has served as the region's tech alliance, championing growth and development in North Central Washington. As a 501(c)3, GWATA's mission is to bring people and technology resources together to create a thriving community. For more information visit www.gwata.org

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Attached photos may be used by media. Please reference photographer in use: JP Portrait Studio. For additional photos, please email info@gwata.org

- 2019 Innovator Awards Winners: Amanda Jeffries, Nathan Hinkle, Beth Okamoto, Kayleigh Elder, Christine Keeley, Max Horrell, Kady Murray, Debbie Gallaher, Jeff Berry, and Jeff Soehren.
- 2019 Future Technology Leader of the Year Award Winners: Christine Keeley, Nathan Hinkle, Beth Okamoto, Kayleigh Elder, Max Horrell, and Kady Murray
- 2019 STEM College Student Innovator of the Year Award Winner: Amanda Jeffries
- 2019 STEM Champion of the Year Award Winner: Debbie Gallaher (not pictured Bob Bauer)
- 2019 Innovative Use of Technology In Business Award Winner: Jeff Berry, Owner and Principal of FocusGeo
- 2019 Entrepreneur of the Year Award Winner: Jeff Soehren, founder of Blue Spirits Distilling
- 2019 Innovator Award Winners with the GWATA Board

SCIENCE IN OUR VALLEY SEMINAR SERIES

DR. VINCENT P. JONES

PROFESSOR & ENTOMOLOGIST
DIRECTOR OF WSU-DECISION AID
SYSTEM, WASHINGTON STATE
UNIVERSITY



Using Decision Science tools to understand the past, improve the present, and anticipate the future of tree fruit IPM

Decision support tools developed at WSU allow us to evaluate historic pest management programs and develop and provide users with new programs that minimize costs, provide the best crop protection, and reduce unintended environmental conditions. The same tool set also allows us to evaluate how climate change will affect crop production, pollination, and pest management in the future.

OCTOBER 2, 2019 | 4:00PM - 5:00PM

CONFLUENCE TECHNOLOGY CENTER

285 Technology Center Way, Wenatchee WA 98801



SCIENCE IN OUR VALLEY SEMINAR SERIES

Fall 2019 Schedule

Every Wednesday, 4:00pm - 5:00pm

SEPT 25 DR. MCLAIN JOHNSON (WA DEPART. OF FISH AND WILDLIFE)

Topic: Estimating Summer Chinook Salmon

Location: WSU Tree Fruit Research & Extension Center

OCT 2 DR. VINCENT P. JONES (WSU-TFREC)

Topic: Using Decision Science Tools

Location: Confluence Technology Center

OCT 9 DEBORAH WELLS (CENTRAL WASHINGTON UNIVERSITY)

Topic: Protecting Our Critical Infrastructure (Cyber Security)

Location: WSU Tree Fruit Research & Extension Center

OCT 16 RAQUEL GOMEZ (GRADUATE STUDENT; WSU-TFREC)

Topic: Modifying Tree Transpiration and Nutrient Mobility

Location: WSU Tree Fruit Research & Extension Center

OCT 23 NADIA VALVERDI (DOCTORAL CANDIDATE; WSU-TFREC)

Topic: Abiotic Stress Physiology in Apple Trees

Location: WSU Tree Fruit Research & Extension Center

OCT 30 DR. YANMIN ZHU (USDA - ARS)

Topic: Dissecting the molecular defense response in apple roots

Location: WSU Tree Fruit Research & Extension Center

NOV 6 DR. CAROLINA TORRES (WSU-TFREC)

Topic: Post Harvest Systems

Location: WSU Tree Fruit Research & Extension Center

NOV 13 DR. VIRGINIA EMERY (BETA HATCH)

Topic: Innovation in Agriculture - Animal feed from Bugs

Location: WSU Tree Fruit Research & Extension Center



Michelle Price
Superintendent
North Central Educational Service District 171

BIO

Dr. Michelle Price is the superintendent at North Central Educational Service District 171. Michelle has a doctorate degree in school administration from Washington State University. Her BA and Masters degrees are from Central Washington University. This is Michelle's 32nd year in education where she has served as a teacher, principal, assistant superintendent for curriculum, instruction and assessment, and superintendent.

During Michelle's tenure as superintendent in the Moses Lake School District, she secured funding and built Columbia Basin Technical Skills Center. She has served on the Workforce Development Board since 2004, demonstrating her commitment to education and business collaboration. In 2017, Michelle was part of Governor Inslee's Switzerland delegation learning about the Swiss Apprenticeship model.

Michelle is a past president of the Moses Lake Chamber of Commerce, Past President of the Washington Association of School Administrators, and serves on the Governance Committee for the National Association of School Superintendents (AASA).

Michelle's passion is in advocating for the highest quality public education for every child every day and providing for multiple pathways for each and every child to be life-ready.

The Hydropower Research Institute

Optimizing Hydropower through Digital Transformation

The Hydropower Research Institute (HRI) is a new data-driven collaborative designed to empower hydropower owners to optimize their projects and remain competitive in a changing electric system. The HRI's mission is to ensure hydropower continues to be the premier electricity-generating resource through digital transformation and technology development.

The HRI will aggregate hydropower operational data, assist hydropower owners in the digital transformation, and facilitate research and development of new technology for hydropower facilities and equipment. Its primary purpose is to use this information to reduce operating costs, avoid forced outages and minimize maintenance time. Chelan County Public Utility District initiated the HRI after identifying a need for improved use of operational data and sensor technology in the hydropower industry. Chelan PUD and Southern Company have contributed to the HRI as founding members. Other generators, vendors, manufacturers and researchers are invited to become contributors and subscribers in 2019.

Data Analytics, Predictive Analysis and Sensor Technologies

Today, hydropower owners and operators evaluate aging equipment based on "placed in service dates" supplemented by condition assessments. In contrast, active monitoring while units are still in service – *before* age and condition become a major factor – can improve industry's understanding of the equipment aging process.

Most hydropower owners and operators already generate, collect, and store operational data using a variety of instruments and sensors. However, raw data from one project has little value for identifying and fixing problems before they become emergencies. A large data set provides more insight into equipment life cycle, stressors and behavior prior to failure. Combining data into aggregated and anonymous datasets allows asset owners to build greater operational intelligence in the hydropower community. The HRI's vendor-neutral platform will allow utilities and manufacturers to convert undervalued data into a critically important tool by facilitating data analytics across their respective fleets and even across all users. The HRI platform will also use an existing cloud provider to reduce complexity (i.e. scalability, security, tools) and development risk for all participants. This will improve asset performance prediction and assist owners and operators with data-driven decision-making.

Ultimately, improved predictive capabilities will enable hydropower owners and operators to efficiently plan major interventions and replacements prior to equipment failure, improving overall fleet availability. Analysis of the aggregated data set can also inform industry demand for research. For example, some sensor technologies developed for other industries may have applications for hydropower. Through a robust research, demonstration and deployment program, the HRI can reduce the risk associated with applying these and other new technologies to hydropower and bringing them to market.



Technology Leadership

The HRI is physically located in Wenatchee, Washington on the Columbia River. While HRI data services will be available from anywhere in the world via the cloud, the Columbia River is a natural place to perform research, demonstrate and deploy new hydropower technologies, and collaborate with experts in the hydropower industry. Ultimately, hydropower owners and operators across the nation will benefit from the HRI and electric customers will benefit from technologies that reduce the long-term costs of hydroelectric generation.

Funding

The HRI will operate on a non-profit basis. Additional asset owners can join the HRI by paying an annual membership fee and contributing operational data. Fees for additional asset owners to join the HRI will be based on operating cost estimates. Finally, manufacturers, vendors, academics and researchers can subscribe to the HRI to receive access to data sets by member permission (for individual member data) or by specific-use license for access to the aggregated data set. Costs for subscribers will be based on license requirements.

While its members and subscribers will fund the operation of HRI, the organization may seek other funding sources. The HRI will actively monitor opportunities to leverage its existing funding to help members with the digital transformation and to respond to emerging hydropower research needs. This may include collaborating with federal or state government programs or private research efforts.

Next Steps

The HRI was incorporated in July 2018, and is on schedule have an aggregated data set available by the end of 2018. The HRI will be ready to begin accepting data contributors and subscribers in 2019. However, if your organization is interested in becoming a contributor, steps can be taken now to ensure your data is ready for the HRI platform. For more information on how to join the HRI, please contact the HRI at info@hridata.org or (509) 866-4HRI.

