
STEM Education Innovation Alliance

Meeting Notes

April 28, 2016

Seattle Metropolitan Chamber of Commerce, Seattle Washington

Gene Sharratt, Executive Director of the Washington Student Achievement Council, welcomed everyone to the meeting.

Overview of Legislative Session

John Aultman from the Washington State Office of Governor updated the group on the 2016 legislative session.

An open letter to the US Congress from the Computer Science Education Coalition and Code.org was sent on April 26, 2016, asking Congress for funding to provide every student in every school the opportunity to learn computer science. It also listed the contributions from contributing organizations that total \$48 million in new private funding. *See press release in meeting documents.*

An ad placed in the Washington Post included nine local signatures and was co-sponsored by Code.org, a nonprofit organization based in Seattle with the mission to advance computer science education. *See "Every Student in America Should Have this Opportunity" in the meeting documents.*

The work of the STEM Alliance helped inform the Governor's Office comments when they contributed to the letter.

John is putting together a list, in collaboration with WSAC, that shows the state's investment in education across all enterprises: higher education, K-12, and ADA (disability component).

The Governor's Office is working to secure a resource to sustainably fund the STEM Alliance.

Maddy Thompson, WSAC Director of Policy & Government Relations, provided more detail on the State of Washington legislative investment in STEM. She summarized – broken out into financial aid, affordability and higher education funding, K-12 STEM investments, and capital budget – what was funded in the 2015 biennial and the 2016 supplemental budgets. *See "STEM Investments" in meeting documents.*

A member mentioned that this funding is a pretty good investment in education.

A member noted that the backfill of higher education was not fully funded; public colleges and universities did get some funding, but not enough to make the full 5% tuition reduction.

Daryl Monear highlighted the key items listed on the timeline associated with the National Governors Association-issued grant. NGA extended the grant to August 31, 2016, to provide additional time to work on the data dashboard and education/industry partnerships. See *“National Governors Association Grant Timeline 2014-2016 and Beyond”* in the meeting documents.

Update: Collaboration with NGA Work-based Learning Project

Eleni Papadakis, Executive Director, Workforce Training and Education Coordinating Board

Eleni is excited about the collaboration happening between this NGA-funded project (STEM) and the NGA Policy Academy on Scaling Work-Based Learning. The outcomes of the project will provide real work-based learning opportunities for young people between the ages of 16 to 29. See *“UPDATED: Washington Team Deliverables”* in the meeting documents.

The draft work space learning definition is not solely about having a young person in the workplace doing actually work. It is also about informing the students about the workplace while they are still in their classrooms - bringing the workplace and what we know about it into the classroom and bringing the young people and the teachers into the workplace. Performance accountability is key - we need to know the quality of work based learning and how we are measuring it.

Daryl Monear is working with an NGA cross-state discussion group on developing a toolkit to help states focus on best practices and measure performance and progress in expanding work-based learning opportunities.

Environmental Scan of Work-Based Learning Opportunities – The Workforce Board will be doing an environmental scan of all work-based learning going on across the state in every sector, targeting a wide variety of population groups. They want to build the “umbrella” that encompasses all of them, to figure out how to advocate for them and pinpoint the programs that are really working. They are picking a handful of those programs as their learning laboratory to assist the project in coming up with policy recommendations for the framework of skills of work-based learning for all young people, assisted by Washington STEM.

The Workforce Board is building a web-based database to match employer opportunities with programs for young people. They have a couple possible sites already that are willing and ready to help them locate the database, and businesses and labor organizations that can help populate and update it.

Part of the grant activities is a Governor’s Summit on work-based learning to be held in May 2017, with a focus around STEM.

Marcie Maxwell affirmed that our progress to date shows Washington State Legislators how important the STEM Alliance is, and hopes it is a priority for them.

Exploration of Scholarships for High Demand Career and Technical Education Degrees

Naria Santa Lucia, Executive Director, Washington State Opportunity Scholarship

Naria introduced Gary Rubens, a new WSOS board member. Gary recently gave WSOS a \$20 million dollar grant, which will allow WSOS to significantly increase the amount of students that they fund. WSOS will be able to fund 14,000 students.

WSOS, with support from Gary Rubens, has a vision for a similar program in the career technical field that expands the current WSOS programs. The public-private partnership of this program is essential and a rich integration between state and private funds.

Naria reviewed some of the statistics and benefits associated with the WSOS to date. She mentioned that the scholarship funds do not pay for all of a student's schooling, but they help minimize the need for living off campus or working while going to school so these students can be competitive in their highly rigorous fields. *See "WSOS: By the Numbers" and "Washington State Opportunity Scholarship" in meeting documents.*

A member asked about the comparison between college graduation rates from students that go through WSOS and normal graduation rates. Naria said 75% of WSOS students graduate and are employed within their field within nine months (national average is 42%) that can be attributed to both scholarship funding and the WSOS support.

Gary Rubens shared that he grew up in a financially poor and non-college educated family in Sequim and Issaquah. He saw education as a way to financial success. He achieved in school but was unable to attend Washington State University due to family finances. He enrolled in vocational/technical classes and built and sold a couple businesses.

Gary complimented College Success Foundation on its program. He said the program's match portion was really important to him - to see his one dollar become two dollars, unusual for a gift to charity. Gary felt he wasn't "wired" to attend a four year university, but he enjoyed automobile mechanics. He talked with students who also were drawn to vocational and technical careers and wondered who is helping them achieve those goals. He noticed the great need for workers in these fields in the workforce (e.g., Boeing can't hire enough aircraft mechanics). He wondered about certificates or technical degrees that require less time to learn and cost substantially less but greatly help Washington's businesses grow. He envisioned creating a program similar to WSOS and wondered if the state would match private donations for students in the high demand vocational/technical skills areas.

He sees that the WSOS student support system helps students persist in their studies, graduate and become employed. His idea is in its infancy, but he suggested one way to proceed is to

modify Washington's current approach. He asked if this is something that sounds interesting and applies to the work that the STEM Alliance members do.

A member from the community college community said she endorses the idea. She sees career technical education meeting many of the state's priorities in terms of economic development in regions throughout the state. She said it will help meet the workforce need in high demand areas that keep the companies here in the state, help them be profitable and keep them hiring a lot of Washington's graduates.

Another member from K-12 education also supported the idea. He said every student has aspirations for greatness beyond high school.

Briefing: STEM Robotics 101 / FIRST in Class

Randy Steele, STEM Curriculum Support, Olympia School District

Randy is a former computer chip designer who went into teaching when his youngest child went off to college. He spoke about a grassroots movement to make robotics more accessible in the public schools. *The presentation "STEM Robotics 101" slides are in the meeting documents and provide additional detail presented in this meeting.*

STEM Robotics 101 is a turnkey curriculum for new robotics teachers and a collaboration tool for existing teachers to make STEM and computer science more approachable for both classroom teachers and students.

The idea for this curriculum was initiated by the Olympia School District in 2010 as part of its STEM initiative. OSD looked at several different platforms and eventually converged onto robotics as an ideal application to challenge its students who are mastering math and science. OSD has expanded its programs to offer courses in computer science, engineering, critical thinking, team work and project management. This coursework exposes students to various engineering disciplines, allowing them to specialize in programming, computer science, system design, or electrical or mechanical engineering.

For those students who are struggling in math and science, robotics provides an application that can stimulate their interest in technology. Robotics provides a pathway for these students and a way to engage students so they can start envisioning STEM and computer science as part of their future.

Their mission statement is to help rural students advance from being mere consumers of technology to become creators of technology.

An Alliance member commented that one thing he likes about STEM robotics is that it allows computers to be useful.

The STEM Robotics 101 outreach has 2,000 registered teachers around the world using the curriculum, with 100 of those teachers from Washington State. The organization has been trying diligently to reach out to local schools. They hope House Bill 1813, with its focus on expanding computer science education, will help them spread the word.

The program's goal is to harness the current excitement, generated mainly in the after school programs, to integrate it into the classroom and expand the student population to include the underrepresented groups in computer science and thus increase equity, especially in middle and elementary schools.

An important task in successful implementation of the program is to train and equip existing teachers to become their schools' STEM teachers and to help their students envision computer science and STEM as a part of their future.

An Alliance member asked about the private match for program funding and if the organization partners with First Robotics' grant. Randy said First Robotics is the fiscal agent. She also asked about expanding the program into preschool to third grade. Randy said they started STEM Robotics 101 in the 7th grade because it was funded using CTE funds but are now aligning it with the 4th through 8th grades.

An Alliance member, who is on the FIRST board and has an FFL team in her school district, said 6th grade girls ask when they can start coding. She said the FFL experience can end up with only privileged students at the competitions. She is excited about the initiatives to build equity into this activity.

Discussions on Key Policy Topics

The members divided into four breakout groups, by key policy topics. Using these questions, they considered what further enhanced investments can be made by the state, what recommendations need further development and what is missing from the group's considerations so far.

The following sections list the members of each breakout groups and a summary of their discussions.

High Level Ideas Generated from Breakout Groups and Potential Policy Recommendations

- Develop a mid-level version of the Washington State Opportunity Scholarship.
- Continue to expand funding for computer science enrollments
- Continue investments in additional MESA enrollments.
- Reaffirm the Dual Credit recommendation from last year.
- Additional investments in K-12 Professional Development and/or funds for equipment or supplies to implement STEM focused projects or curriculum.
- Enhance the High School and Beyond plan requirements

- Leverage state investments in K-12 basic education for STEM outcomes, critical for job and postsecondary readiness.

Early Learning to K12

Participants: Randy Spaulding (facilitator), Susan Enfield (reporter), Cindy Gustafson, Glen Malone, Randy Steele, Sam Whiting, Nancy Truitt Pierce, Jeff Estes, and Marcie Maxwell
The group discussion coalesced around four big ideas:

1. As we think about our recommendations, we need to be mindful of other agencies' work. We need to provide a means to inform and be informed by that work. This may include advocacy for initiatives or recommendations coming from our partners.
2. STEM literacy is a critical competency for 21st century learners. As such, STEM education should be viewed as a critical part of basic education and the McCleary decision.
3. Professional Learning is critical to student success. We need to rethink our approach to professional learning and provide dedicated time for teachers to learn and collaborate. One specific suggestion was to provide full release days with an explicit responsibility for curriculum planning of multi week units so both teachers and students are better prepared. Also, the group noted that this may be part of a larger issue around teacher compensation.
4. Need to provide opportunities for educators to share practices across institutions. This could include joint collaboration time at a conference or other convening and/or online collaboration tools.

The group also added that there is need to revisit House Bill 1813 to look at what was funded, what works, and what should be enhanced.

High School to Postsecondary Transitions

Participants: Rachelle Sharpe (facilitator and reporter), Gene Sharratt, Nova Gattman, Juliette Schindler Kelly, Gil Mendoza

Evaluate outcomes and create accountability systems to understand whether students are provided with broad college and career opportunities at all levels of education

- Evaluate individual education plans
- Make progress on disability taskforce recommendations
- Align with ESSA metrics
- Broaden awareness of 24 credit graduation requirements and using variable routes
- Increase access to career guidance and navigation
- Boost professional development for counselors for guidance regarding STEM in both 2 and 4 year programs
- Engage family engagement coordinators
- Use more flexible federal funding to incent districts to offer integrated STEM education

- Evaluate participation in work-based learning
- Allow career exploration of STEM
- Bolster public private partnerships for experiential learning opportunities
- Provide mentors to engage and understand local industries
- Manson SD has a requirement for grades 9-12
- Allows for flexibility
- Incorporate and evaluate high school and beyond plan experiences
- Ensure dual credit opportunities include and encourage professional technical pathways

Metrics Discussion

Add work based learning participation to #5 through the measurement section

- Use the environmental scan being done

Mid-Level Skills and Education

Participants: Maddy Thompson (facilitator), Gilda Wheeler (reporter), Brian Bonlender, Yale Wong, Margaret Tudor, Dana Riley Black, Naria Santa Lucia, Ellen Matheny, Eleni Papadakis

Faculty -

- Professional development is needed for professional and technical faculty; faculty needed to be certified in certain areas and skills updated.
- Shortage of faculty due to compensation: faculty salaries don't compare to wages in industry. Possible solutions include:
 - Public/private partnership model (such as loaning employees as faculty)

Labor Market Information and Career Connected Learning -

- There is a need to develop and better disseminate useful labor market information for use by parents, students and working adults considering returning to postsecondary education:
 - Possible solutions include: a targeted workforce study that takes the Joint Report a step further and focuses on STEM needs, specific survey for STEM-related employers (projected needs), and education supply
- Intensify career guidance for students in schools (not meaningful enough currently, need to make this visceral for students). Possible solutions:
 - Work with school leadership to understand the importance of this
 - Dedicate counselor time to career counseling
 - Make careers real for kids by seeing professionals at work
 - Make better use of Washington career guidance association, OSPI student services and guidance division materials
 - Leverage McCleary dollars for STEM/CTE purpose

Create Program to Incentivize and Support Access and Completion in Mid-Level STEM -

- Reinstitute and expand WAVE

- Create Opportunity Scholarship-like program for students in mid-level STEM programs and include component for wrap around emergency services to enhance completion and success (Statutory change probably required: could be done by altering Opportunity Grant statute, by altering Opportunity Scholarship statute or through altering the WAVE scholarship)
- This new program needs four components in place to be successful:
 - Adequate faculty (supply and skills) in community and technical colleges (so we need to address compensation compared to industry and updating skills through professional development and certifications.
 - Financial aid for scholarships and support services for completion
 - Career-connected learning in K-12 to increase awareness of mid-level skills in STEM and building employability skills
 - Help employers understand how to work with students and simplify the process where possible

Connections between Education and Industry -

- Need to invest in the intermediary role so intermediary can support student learners, educators and employers
- Convince employers to invest in employees (Massachusetts is working with low-income employees example, COSTCO invests in employees)
- Low to no-interest degree completion loans targeted to working-age adults (social impact fund?)
- Loosen up internship regulations
- Utilize workforce development system to reach larger segment of the population

Baccalaureate and Graduate Level Education

Participants: Marc Webster (facilitator and reporter), Daryl Monear, John Aultman, Ed Lazowska, Yolanda Watson Spiva, Cody Eccles

The group's discussion focused on a few core ideas:

Expand capacity in key fields in which employer demand is outpacing degree production.

- Computer Science is facing the most pressing capacity shortage. At UW, one-third of qualified applicants (350 students per year) are turned away due to insufficient capacity. Student demand is not being met. Programs like Code.org and First Robotics will continue to have an impact on student interest, which is a very good thing. But higher education capacity will need to grow to meet the student demand.
- Both needs for increased space (capital funding) and for increased faculty numbers should be addressed in order to increase enrollment capacity.
- Engineering is also a field in which we see degree production is not meeting employer demand for skilled workers.
- Both of these fields play large roles in the aerospace industry in Washington. A recent WDC report has shown that the greatest workforce gap in the aerospace industry is for

computer science specialists. This report also highlights a trend at Boeing to move some of their engineering shops to other parts of the country because they need the ability at times to hire large numbers of engineers for relatively short term projects. Having units spread out gives them more flexibility.

Capacity pressures and bottlenecks in the four-year sector could be alleviated by expanding capacity in the two-year sector.

- Improving and streamlining student transfer pathways from 2-year to 4-year institutions in key fields, like computer science and engineering may ease capacity issues.

Enhance support systems to improve student persistence and success

- Introduce more rigor in the High School and Beyond planning process to better prepare students for postsecondary success.
- Streamline program coursework by eliminating “dead-end intro” courses that are different than the intro courses that students who have already decided to major in the field take.

Expand programs proven successful in helping historically underrepresented minorities succeed

- Washington State Academic RedShirt (STARS) program provides highly motivated students who are [eligible for financial aid](#) with a specialized [curriculum](#) designed to build learning skills and academic preparation.
- Math Academy: High-achieving high school juniors from Washington State lodge on the University of Washington campus in Seattle for a four-week, intensive, summer session. Students engage in coursework created by UW math faculty and designed to develop the skills necessary to meet the high standards of college-level math and engineering. Students also have enrichment opportunities to explore the range of career opportunities available to engineers through lab tours, research projects, site visits and networking events.

Meeting notes recorded and summarized by Washington Student Achievement Council staff members Ellen Matheny and Daryl Monear.

STEM EDUCATION INNOVATION ALLIANCE - April 28, 2016 Meeting Attendance

APPOINTED MEMBERS		
First Name	Last Name	Position Title
John	Aultman	Executive Policy Advisor for Higher Education and Workforce Development
Brian	Bonlender	Director
Maud	Daudon	Director & CEO
Susan	Enfield	Superintendent
Jeff	Estes	Director, Office of STEM Education
Christine	Johnson	Chancellor
Ed	Lazowska	Bill & Melinda Gates Chair
Glenn	Malone	Executive Director
Marcie	Maxwell	Citizen Member
Eleni	Papadakis	Executive Director
Dana	Riley Black	Executive Director STEM, Legislation & Partnerships
Naria	Santa Lucia	Executive Director
Gene	Sharratt	Executive Director
Nancy	Truitt Pierce	Director, School Board
Margaret	Tudor	Executive Director
Yolanda	Watson Spiva	President & CEO
Sam	Whiting	President & CEO
Yale	Wong	Chairman and Founder
ALTERNATE MEMBERS		
First Name	Last Name	Position Title
Gil	Mendoza	Deputy Superintendent
OTHERS		
First Name	Last Name	Position Title
Cody	Eccles	Associate Director
Nova	Gattman	Legislative Director
Cindy	Gustafson	Chief Financial Officer
Ellen	Matheny	Assistant Director of Operations
Daryl	Monear	Associate Director for Academic Affairs and Policy
Gary	Rubens	Founder
Juliette	Schmidler Kelly	Director of Government Relations
Rachelle	Sharpe	Deputy Director
Randy	Spaulding	Director of Academic Affairs and Policy
Randy	Steele	Career & Technical Education Coach
Maddy	Thompson	Director of Policy & Government Relations
Natalie	Truong	Policy Analyst, Education Division
Marc	Webster	Fiscal Policy Advisor
Gilda	Wheeler	Senior Program Officer
First Name	Last Name	Position Title
		Washington State Office of the Governor
		Washington State Department of Commerce
		Seattle Metropolitan Chamber of Commerce
		Highline School District
		Pacific Northwest National Laboratory
		Community Colleges of Spokane
		University of Washington Computer Science & Engineering
		Puyallup School District - Assessment, Accountability & Student Success
		Former State Representative
		Workforce Training and Education Coordinating Board
		Everett Public Schools
		Washington State Opportunity Scholarship
		Washington Student Achievement Council
		Monroe Public Schools
		Pacific Education Institute
		College Success Foundation
		Thrive Washington
		General Biodiesel
First Name	Last Name	Position Title
		Office of Superintendent of Public Instruction
First Name	Last Name	Position Title
		Council of Presidents
		Workforce Training and Education Coordinating Board
		Washington STEM
		Washington Student Achievement Council
		Washington Student Achievement Council
		Start It Labs, Rubens Family Foundation
		College Success Foundation
		Washington Student Achievement Council
		Washington Student Achievement Council
		Olympia School District
		Washington Student Achievement Council
		National Governors Association, Center for Best Practices
		Washington Student Achievement Council
		Washington STEM