



STEM Education Alliance Data & Metrics Subcommittee

Washington STEM &
Education Research and Data Center (ERDC)



Framing

Metrics Committee Co-Chairs:

- Jim Schmidt - Director, Education Research and Data Center
- Angela Jones - CEO, Washington STEM

THANK YOU to Metrics & Data
Subcommittee

Purpose: Identify, update, and make available appropriate metrics for the STEM Alliance

Opportunity: As the STEM Alliance refreshes and refines our vision and goals, we have the opportunity to identify the metrics that will inform our strategy development and implementation. These metrics will be critical to the creation of the STEM Alliance's annual report card to ensure it's a useful tool in informing decision-makers and practitioners.

Timing: Q2 and Q3 workgroup meetings; update metrics by July [*August*] for use in identifying policy goals and creation of next Report Card; 3-5 meetings in May, June, possibly early July.

Recall: Original 2013 Framework and indicators



EARLY LEARNING-HIGH
SCHOOL STUDENTS



EARLY LEARNING-HIGH
SCHOOL EDUCATORS



POST SECONDARY AND
EMPLOYERS



ALIGNED SYSTEMS



Indicators Available on 2020 Report & Dashboard

Pre-K STEM Readiness

- What percent of students show up “math ready” in Kindergarten, and what, if any, differences are there by gender?
- What is the associated Kindergarten math readiness outcomes for students who participate in specific early learning programs?

K12 STEM Achievements

- What percent of K12 students demonstrate grade-level skills in Math and Science on standardized assessments, and what are the disparities in outcomes by race and by students’ family income?

College Readiness

- What percent of students pass AP Exams in STEM subjects and what are demographic disparities in AP Exam passage rates?
- For which AP subjects have we seen increases or decreases in exam rates?
- What is the participation by gender in STEM subjects in high school as represented by completion of AP exams?

Student Interest

- What percent of Washington SAT test takers indicated an intended college major in a STEM field?



Indicators Available on 2020 Report & Dashboard (Cont.)

STEM Degrees

- How many awards are conferred to students completing STEM programs?
- What are the gender and racial disparities in STEM postsecondary degree completion?
- What are the STEM degree completions totals over time for mid-, baccalaureate-, and graduate-level degrees?

STEM Awareness

- What percentage of Washington residents have heard of the STEM acronym?

Workforce Alignment

- How many job openings are posted over time, with regard to STEM and non-STEM jobs, in Washington?
- Workforce Gap Analysis for Bachelor's and Advanced Degrees in Computer Science and Engineering
- How has workforce demand increased/decreased for specific STEM industries and occupations over time?



Recall: Current STEM Alliance Resources

Current Website: <https://stem.wa.gov>

Current Dashboard: <https://erdc.wa.gov/data-dashboards/STEM>

2019 Annual STEM Report Card:

<https://stem.wa.gov/wp-content/uploads/2019/01/2019STEMEducationReportCard.pdf>

2020 Annual STEM Report Card:

<https://wsac.wa.gov/sites/default/files/2020.STEM.Education.Report.Card.pdf>



External Stakeholder Feedback, Summary

Requested disaggregation:

- Race (including sub panethnic categories), income status, ELL, foster youth, disability status, and gender for all metrics
- Geography, including but not limited to, Education Service District, Legislative District, County, and School District, whenever possible for all metrics
- Outcomes for public K-12 originating students versus out-of-state individuals whenever possible and relevant
- Outcomes by high school adjusted cohort whenever possible and relevant
 - This is especially salient for higher education outcomes and workforce outcomes

Requested Additions:

- Financial aid applications & use among STEM-interested students and STEM-declared majors
- Apprenticeship outcomes for related STEM apprenticeship occupations/SOCs/programs
- Career Connect Washington outcomes in STEM programs (Apprenticeships, Career Launch Endorsed Programs, Industries)
- Advanced STEM Subject Availability in Districts and Schools
 - Such as: STEM Dual Credit availability as well as enrollment and completion rates (including CTE)
- Teachers and school leaders with STEM-related degrees, credentials, and other experience needed for teaching STEM courses
 - Including gaps in the STEM teaching workforce
 - AP/CHS qualified teachers (generally, teacher credentials)
 - CTE course availability and teacher credentials held
- Profile students who switch majors (to STEM, from STEM, both?)
- Systems inputs (See WA STEM's STEM by the Numbers, which we will review on next slide)



Related Boards/Workgroups, Tools, Reports, Dashboards

STEM Alliance Current Sources:

- STEM Alliance dashboard
- STEM Alliance Report 2019 and Report 2020

WA STEM:

- State of the Children
- STEM by the Numbers
- Labor Market Data Dashboard (with Employment Security Department)
- Credential Opportunity by Region & Industry Matrix (CORI)
- Career Connect Washington outcomes dashboard

ERDC:

- High School Graduates Outcomes Dashboard
- Public Higher Ed Enrollment Dashboard

Boards/Groups:

- WSAC-led Dual Credit Taskforce
- OSPI Dual Credit work (internal dashboard)
- Workforce Education Investment Act Oversight Board
- Career Connection Washington initiative
- PESB teacher shortage map:
<https://www.pesb.wa.gov/workforce/educator-shortage/>



Other Tools & Reports Links

WA STEM:

- [State of the Children](#)
- [STEM by the Numbers](#)
- [Labor Market Data Dashboard \(with Employment Security Department\)](#)
- [Credential Opportunity by Region & Industry Matrix \(CORI\)](#)
- [COVID 19 Employment tool](#)
- [Career Connect Washington outcomes dashboard](#)

ERDC:

- [High School Graduates Outcomes Dashboard](#)
- [Public Higher Ed Enrollment Dashboard](#)

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Updated/Proposed Framework and Indicators

EARLY LEARNING - EMPLOYMENT



STUDENT STEM OUTCOMES



STEM SYSTEM INPUTS



DISAGGREGATION & REGIONALITY



ACTION & ALIGNMENT

1. Indicators to add: Student Outcomes

- Student interests & readiness as measured by coursetaking (not tests; possibly HSBP) + their associated outcomes (cross-sector)
- Student experiences (qualitative)
- K-12 Coursetaking data: STEM coursetaking in general, advanced coursetaking, and ALL 6 types of dual credit coursetaking by subject, demographic, geography, school, district, including CTE specifically
- Student transfer rates between 2-year and 4-year institutions for STEM trajectories
- # and demographics of WA Students who hold STEM jobs, are in STEM industries, and/or who hold STEM degrees (and not all 3 at once too)
- Kindergarten Readiness in Math + all 6 areas
- Financial aid use/uptake and outcomes, including WSOS

2. Indicators to add: Systems Inputs

- Higher education institution, program, and apprenticeship capacity
- Gap between supply and demand (all the factors that contribute to that)
- Job openings by sector/occupation, especially STEM
- Knowledge & bias of staff and counselors (could highlight CCER, WA STEM, and other research)
- STEM Teacher workforce gaps + demographics of STEM Teachers (and higher ed faculty?)
- STEM occupation/career retention over time + into leadership roles (may have to be a future goal once we have the occupation data rolling in)
- K-12 course availability and programs at the secondary level, especially STEM courses & pathways, including skills centers and 18-21 yo programs
- Ed institutions that have held equity audits and have created strategic plans focused on equity (??)
- After school and extended learning opportunity availability and uptake, esp. STEM-related

3. Approaches, Disaggregations, etc.

- Disaggregation for all indicators by all demographics (ability, language, income, race, etc) on dashboards with highlights in reports
- Definition of STEM and what is included up front
- Provide data for the dual goals outlined in the RCW: increasing STEM education attainment/outcomes + which strategies/ initiatives are contributing to better outcomes
- Ensuring that data is not/cannot be weaponized (ie. connecting student outcomes and systems inputs always) + centering Targeted Universalism
- More specific goals recommendations + policy recommendations (both legislative and agency policies)
- How we compare on any of our metrics with other states, when possible
- Data by school, including for students not in traditional K-12 schools (homeschool, online, ALE?)
- Disaggregate by region as well as rural vs. urban
- Provide links to all reports with descriptions of how to use



Jamboard

https://jamboard.google.com/d/1hCXpyAi2oawqsW0ivrI0RnLAwwLrA1Ulmy0n_moT1U0/viewer?f=0

Summary of additions

1. STEM coursetaking (including gatekeeping course)
 - a. attempts, completions, and GPA, by demogs;
 - b. both secondary and postsecondary
2. Dual Credit:
 - a. coursetaking,
 - b. completion,
 - c. by dual credit type and content area
 - d. credits earned;
 - e. by demographic and by region or district
3. Student experiences (explore with WSAC for inclusion in the report as exposés, WA STEM and other partners can provide)
4. WA originators who have gotten jobs in STEM sectors/industries
 - a. by demographic & geography, using WIOA populations as well



STUDENT STEM OUTCOMES

Summary of additions



STEM SYSTEM INPUTS

1. STEM job openings
 - a. Including STEM and STEM literate jobs
 - b. Including credential needed and regional wage
 - c. By region
 - d. Borrowing or incorporating WA STEM Labor Market Data Dashboard
2. K-12 STEM course availability
 - a. By subject area
 - b. By geography
 - c. By school type (Title, rural, other factors)
3. Dual Credit course availability
 - a. By subject area
 - b. By geography
 - c. By school type

Summary of additions

1. Disaggregation:
 - a. Report on WA K-12 originators as a separate demographic whenever possible
 - b. Report on systems' and institutions' implementation of racial and other disaggregation best practices (EOGOAC)
 - c. Geography, regionality
 - d. Programs (ELL, low-income, etc)
2. Making reports and resources available in one place, on website, including:
 - a. State of the Children
 - b. PESB Teacher Pipeline reports



DISAGGREGATION & REGIONALITY



ACTION & ALIGNMENT

EARLY LEARNING - EMPLOYMENT

Forthcoming & Retiring



1. 2022: Higher education and apprenticeship program capacity in STEM and STEM literate pathways and programs
 - a. By region
 - b. Compared to job openings
2. 2022: STEM occupation retention & job progression/leadership progression
 - a. By demographic
 - b. By industry
 - c. By K12 originators
3. Return to other metrics in 2022, such as:
 - a. Access to high quality early learning; financial aid use among STEM intended majors; STEM teacher workforce
4. Retiring: STEM Awareness surveys
 - a. We are at over 90%, focus efforts on other data collection

Appendix

Framing: STEM Alliance purpose & audience

- “The STEM education innovation alliance is established
- to advise the **governor** and to provide vision, guidance, assistance, and advice to support the initiatives under this chapter [RCW 28A.188.030],
 - as well as **other current or proposed programs and initiatives** across the **spectrum of early learning through postsecondary education**, that are intended to increase learning opportunities and improve educational outcomes in STEM.”



Approach

Values of antiracist data strategies & measurement for change

- Measuring (and making available) systems inputs, not just student outcomes (not gap gazing)
- Recognizing how data has been weaponized against minoritized communities

Improvement & learning mindset

- Review of feedback from past reports + deep listening to constituents throughout the state
- (Purpose & Audiences = next slides)

Utilizing currently available tools, data, and dashboards (nonduplication, “aligning & combining” per RCW)

Relevance & Usefulness of the data and metrics

- Regionality, disaggregation of demographics, K-12 originators vs. all other adults



Audiences in WA Who Need STEM Data

“...as well as other current or proposed programs and initiatives across the spectrum of early learning through postsecondary education, that are intended to increase learning opportunities and improve educational outcomes in STEM.”

1. Birth to career education leaders/agency leaders
2. K-12 administrators & teachers
3. Higher education leaders
4. Apprenticeship program leaders & supporters
5. Employers and business organizations
6. Early learning leaders and supporters
7. Nonprofits
8. Scholarship initiatives (Washington State Opportunity Scholarship)
9. Networks, collective impact collaboratives (STEM Networks, Strive Networks)
10. Career Connect Washington networks, coordinators, intermediaries
11. Families/students/(nothing about us without us)--translation to tools that use data for students and families to use for their own pathway navigation



Framing: Alignment, Metrics, Data

The STEM education innovation alliance shall initiate its work by

- aligning and combining previous STEM education strategic plans into a single, cohesive, and comprehensive STEM framework for action and accountability.

The framework must

- concentrate on a limited number of selected and specific measures
- that are meaningful indicators of progress in increasing STEM learning opportunities
- and in achieving the intended longer-term outcomes of such efforts.

The framework must use measures that are quantifiable and based on data that are regularly and reliably collected statewide.