The Next Generation STEM Teacher Preparation in Washington State: Moving Forward to Achieve the Vision, 2016-2020

Goals:

- Improve the majority of STEM teacher preparation programs in the State of Washington
- Increase the recruitment of qualified and diverse STEM students into teaching who reflect the demographics of WA
- Create an adaptive, research-based model for improving STEM teacher preparation through collaboration

Funded by National Science Foundation

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Project Framework: Collective Impact Model for Organizational Change

(Hanleybrown, Kania, and Kramer. 2012. Channeling Change: Making Collective Impact Work. Stanford Innovation Review)

- Common Vision: One size does not fit all, but shared goals and visions are more likely to be realized.
- Shared Measurement: Results are measured consistently, with shared accountability.
- Mutually Reinforcing Activities: Activities of each group inform others' plans.
- Continuous Communication: Builds and maintains trust, collaboration, and motivation.
- Backbone Support: Overall coordination and management.

Partners: The Current NextGen-WA Consortium Includes:

(Additional members with an interest in improving STEM teacher preparation in Washington State are welcome to join)

- Education and STEM faculty and administrators from all 6 public, four-year Institutions of Higher Education (IHEs): Central Washington University (CWU), Evergreen State College, Eastern Washington University (EWU), Western Washington University (WWU), Washington State University (WSU-Vancouver, Pullman, and Tri-Cities) and the University of Washington (UW-Seattle and Tacoma)
- Education and STEM faculty and administrators from 6 private, four-year IHEs: Heritage University, Northwest University, Seattle Pacific University (SPU), Seattle University (SU), Walla Walla University, and Whitworth University
- Western Governors University (WGU), an online, competency based Teacher Education program that serves students in all 50 states
- Faculty and administrators from two-year colleges including Olympic College (OC), North, Central, and South Seattle Colleges (SC), Skagit Valley College (SVC), and Whatcom Community College (WCC)
- Government representatives from the Office of the Superintendent of Public Instruction (OSPI), Professional Educator Standards Board (PESB), several Educational Service Districts (ESDs), Compass 2 Campus, and Pacific Northwest National Lab (PNNL)
- P-12: science and math teachers, principals, and district administrators from Bellingham, Central Kitsap, Seattle, Ellensburg, and several other districts around the state and
- NGO and business representatives from: Code.org, Facing the Future, Google, Mathematics Engineering, Science Achievement (MESA), WA- Leadership & Assistance in Science Education Reform (LASER), WA-STEM, Washington Teachers of Teachers of Science (WA-ToToS), and Washington Teachers of Teachers of Math (WA-ToToM)

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Project includes ongoing, formative and summative Research and Evaluation of the development and design processes and effectiveness of each WG and Team, as well as the project as a whole.
Internal evaluation will document how the Management Team and External Advisory Board conduct their work and their rationale for making decisions (i.e., the design process), and will study the conditions under which specific efforts support the goals of the project.
External evaluation will focus on the effectiveness of the Capacity-Building WG's and the STEM TP critical component WG's.

1. We will study the extent, quality, and effectiveness of how the projects' processes, including statewide collaboration, impacts all Working Groups;
2. We will study and evaluate the resources and products designed and delivered by the WG's, and the extent to which WG's products and practices impact IHE's STEM TP programs, and what conditions foster or inhibit change.

Research will rely heavily on interviews and survey responses.
The primary research questions are: 1) In what ways do collaborations affect STEM TP programs? 2) What models of collaborations have the most impact? 3) What factors are most important for diverse students in deciding to pursue STEM teaching?

Success Criteria of the project include improvements, as measured against baseline institutional data, in the specific areas of each WG, as well as the following broad areas •STEM teaching is promoted as an exciting and fulfilling career rather than a back-up plan •Future teachers' experiences with undergraduate STEM courses model the student-centered learning experiences that they are expected to re-create with their students •TP programs are structured to foster continuous improvement via feedback and collaboration with inductees, school, industry, government and other community stakeholders •Changes and choices of courses, curricula, and pedagogy are evidence-based.

Structure of Washington's NextGen STEM Teacher Preparation Project

Capacity-Building Working Groups will address:

- **Organizational Change issues**: building leadership capacity to overcome common barriers to program change at the State, Institution, College, Departmental, and Faculty levels
- **Diversity issues**: addressing the critical state need for graduating STEM teachers who reflect the state's demographic diversity through targeted recruitment of students in STEM majors, leveraging of existing resources, and sharing effective practices and programs across institutions
- **Collaboration Building**: leveraging the collective expertise and interest of multiple institutions and individuals to develop, support, and sustain change.

Capacity Working Groups consist of 12 to 20 cross-institutional partners working collaboratively, and their results inform all aspects of the project.

Implementation Groups

State Implementation Council
consists of Administrator-level IHE reps charged with supporting broad org. change and reform efforts. Members of the State Implementation Council support implementation efforts at the regional, institutional, departmental and course level.

Regional Implementation Teams:
Adopt, adapt, implement, and evaluate the resources and tools developed by the Working Groups to transform practices at the regional, institutional, departmental, and course levels.

Management Team
Consists of the facilitators and co-facilitators of the Capacity-Building (see above) and STEM critical-component (see below) Working Groups, as well as the PI's of the project, plus Office of Superintendent of Public Instruction (OSPI) and WA-LASER reps. The MT is responsible for backbone support for entire project, including overall budgets, planning, and communication infrastructure, as well as project dissemination activities

External Advisory Board
Consists of representatives from IHE's, K-12 and other organizations directly involved in STEM Teacher Preparation and diversity initiatives

STEM TP critical component Working Groups are

•Clinical Practice and Induction •Strengthening PCK •Integrating Computer Science into TP •Integrating Engineering in TP •Integrating Education for Sustainability into TP •Math and STEM integration.

These cross-institutional WG's are charged with researching and leveraging best practices, developing materials and resources, and creating and offering Professional Development to IHE faculty and administrators, representatives from K-12, NGO's, and business and government stakeholders. Each WG will include results from the Capacity-Building WG's to increase its effectiveness and long-term impacts. WG's might also prepare webinars and manage Professional Learning Communities to support long-term impacts of their work.

Critical Component Working Groups consist of 12 to 20 cross-institutional partners working collaboratively.

Arrows indicate regular feedback, support, communication and assessment, as well as research and evaluation processes

Timeline and Commitments include two main levels of Working Group participation:

A core group member of 4-8 people who will research, synthesize, develop, pilot, and revise materials and Professional Development workshops for colleagues from across the State. Compensation, typically ranging from 1 to 2 weeks' time/year, will support active participation and product development.

An expert Review-Liaison member who will provide input and feedback on the materials and models developed by their Working Group and act as liaisons with their institutions. Reviewer-Liaisons will typically be supported with travel funds to attend NextGen meetings and Professional Development workshops.

- Annual Meetings for all Implementation Teams and Working Groups
- Professional Development provided by individual Working Groups in years 2 to 4
- Working Groups and Implementation Teams develop plans and strategies throughout the period