

2019-2021 Biennium Internal Budget Proposal Narrative

Division: SMATE

Evaluation Criteria: Proposals will be evaluated on every aspect of this template. It is highly recommended that the narrative portion touch on each area. Proposals forwarded to UPRC by unit leaders will be discussed at UPRC and authors are encouraged to attend so that they may answer questions and provide clarification.

SMATE Staffing Proposal: Investing in the success of K-16 STEM students and faculty

- This is a revised version of a previously submitted budget proposal.
If box is checked please briefly outline any significant changes and/or indicate why it is being resubmitted.

Funds for a K-12 STEM outreach/coordinator position and for a Research and Evaluation position to support STEM and non-STEM education projects were requested in a prior decision package proposal submitted with Woodring College of Education to address critical STEM teacher shortage needs in Washington State.

Statement of Purpose: *(What is the challenge or opportunity being addressed? How does the proposal address this challenge or opportunity? Limit response to 1 page – please link to any existing reports, data, supplemental materials, etc.)*

The Challenges

Improving undergraduate STEM education and lowering achievement gaps. In order to improve admission, retention, and graduation rates for underrepresented minority students in WWU STEM courses and teacher preparation, STEM instruction must shift toward evidence-based practices, and better align with K-12 science standards, teacher evaluations, and active learning reforms. As students transition from high school to college, continuity of learning strategies is important, and active learning is a pedagogical approach that improves undergraduates' learning in science and engineering, especially underrepresented students (National Research Council, 2012). Accordingly, active learning is a priority in WWU's strategic plan.

Preparing future teachers to teach STEM. WWU preservice teachers take a variety of STEM content courses and science education courses, and increasing the use of active learning strategies would increase the success of underrepresented students (NRC, 2012), which would help address Washington State's mandate to increase the number of science teachers in the state, particularly teachers of color, to better represent the student demographics in the state.

Supporting STEM faculty members' discipline-based education research. As competition for federal and state grant dollars increases, it is important that proposals include research-based educational interventions and rigorous research and evaluation plans. Faculty members' participation in grant-funded projects help them develop their instructional knowledge and skills, and give them opportunities for scholarly presentations and publications that support promotions and tenure.

The Opportunities

SMATE staff members have the knowledge, skills, and relationships with K-12 schools and higher education faculty members to help improve STEM education, STEM teacher preparation, and faculty research and scholarship at WWU. However, much of the funding that has traditionally supported these staff members have been redistributed to school districts, and staff members supported by external grants are not contractually allowed to collaborate with faculty to develop grants during their grant contracted work time. Over the past 10 years, SMATE faculty members have increased from 9 to 16, while permanent SMATE staff position numbers have remained unchanged in the university operating budget. Furthermore, over the past two years, four members of the SMATE Research and Evaluation team have left WWU for permanent positions, and now only two quarter-time team members remain.

SMATE seeks funding for two, full-time 9-month staff positions; one for STEM Education professional development and K-12 partnership support and the other for STEM Education research and evaluation support. State funds are requested to support their work during the academic year, while external grant funding will be obtained to support their work during the summer.

- **Director of STEM Education Research and Evaluation** position to partner with faculty to develop grant-funded projects that support improvements in K-16 STEM teaching and learning through evidence-based interventions and methodologically rigorous research and evaluations.
- **Director of Faculty Professional Development and K-12 STEM Partnerships** position to develop partnerships across STEM departments and between K-12 and higher education communities to support K-16 instructors' effective use of inclusive, active learning practices, and to better recruit and prepare a more diverse STEM and STEM teaching workforce.

Anticipated Outcome(s):

- Strengthened collaborations with school districts and organizations in Washington State to improve access to high-quality K-12 STEM teacher preparation and professional development, leading to a more diverse and highly-qualified STEM/STEM teaching workforce.
- Enhanced competitiveness and capacity to obtain external funding for research, evaluation, and professional development projects leading to improvements in our collective understanding of, and ability to implement research-based, high-impact, STEM education instructional practices.
- Increased faculty member involvement in professional development and community/K-12 outreach leading to improved student access to high-quality STEM education, more inclusive teaching and learning environments, greater retention in STEM majors, and higher graduation rates.

Metrics: *(How will outcomes be measured? Please include current data points and goals. If this proposal will have any impact on the [Overall Metrics](#) included in the university's strategic plan, please indicate which specific ones here.)*

- **Teacher preparation and K-12 partnerships: we expect to increase the enrollment of underrepresented minority students in STEM and increase the number of undergraduate STEM degrees awarded (Washington Impact)**
 - Increase in the number of underrepresented minority high school graduates matriculating to WWU who are interested in STEM or STEM teaching careers.
 - Increase in the quality, number, and geographic distribution of K-12 mentor teachers and classrooms available for WWU's preservice STEM teachers to be placed in.
 - Increase in the number, type, and quality of K-12 professional development and curriculum development opportunities/services provided by SMATE staff and WWU faculty members on an annual basis.

- **Undergraduate teaching/learning: we expect to increase first to second year retention rates; 6 year graduation rates; and transfer 4 year graduation rates for STEM students, ultimately increasing the number of STEM degrees awarded (Inclusive Success/ Washington Impact)**
 - Enhanced persistence, success, retention, and graduation of WWU students in STEM/STEM teaching majors (particularly underrepresented minorities and women)
 - Increase in the number of secondary STEM teacher graduates/year
 - Increase in the diversity of STEM/ STEM teaching workforce to more closely mirror the demographics of Washington State
 - Decrease DFW rates in STEM courses because of improved instruction.
 - Increase faculty satisfaction with the quality and utility of professional development designed to support implementation of inclusive, active learning strategies in classrooms and departments (as measured by surveys and interviews).
 - Implementation and approval of a new model for faculty peer observations and feedback that supports faculty members as they incorporate and improve inclusive, active learning strategies.

- **External Grant funding: we expect to increase the number of externally funded research and sponsored programs in SMATE and CSE (Academic Excellence)**
 - Increase in the number and type of STEM education proposals developed and submitted by faculty and staff with direct input from the two Directors.
 - Increase in the number of external grants awarded with the Directors of Research and Evaluation and K-12 Partnerships involved as Co-PIs or senior personnel.
 - Increase the number of scholarly presentations and publications from STEM faculty.

How does this proposal align with your departmental/divisional strategic priorities? *(Please reference specific items from the recently completed departmental/divisional strategic plan and attach a copy.)*

CSE: Promote teaching practices to educate thoughtful leaders and problem solvers.

SMATE: Promote teaching practices to educate thoughtful problem solvers.

Ensure all SCED courses use evidence-based, student-centered pedagogy, grounded in the latest research on teaching and learning

- Provide professional development opportunities that support faculty in implementing inclusive, student-centered practices in SCED classrooms.

Shape a culture in the college that supports student-centered learning

- Expand and coordinate a college-wide TA professional development program to meet changing course support needs.
- Facilitate college-wide learning and implementation of student-centered practices.

CSE: Nurture a supportive and inclusive environment and culture.

SMATE: Nurture a supportive and inclusive environment and culture.

Continue building SMATE into a program that is reflective of the diverse communities it serves

- Actively recruit to build diverse student populations by partnering with student groups (e.g. SACNAS) that focus on underrepresented populations in STEM.

Promote best practices sustaining and supporting equity, inclusivity, and diversity

- Provide ongoing professional development for faculty and staff to create inclusive classrooms.
- Develop and implement research and evaluation programs to identify and mitigate local barriers for each individual SMATE student.

Invest in programs that support student success

- Expand professional development for, teaching assistants, and learning assistants to build capacity for implementing active learning strategies.
- Develop programs that explicitly help students assess and improve cognitive and social/emotional skills.

CSE: Balance capacity with student demand to ensure program sustainability and quality.

SMATE: Balance capacity with student demand to ensure program sustainability and quality.

Manage demand through a combination of targeted program growth and restricted enrollment

- Grow enrollment in existing, high demand programs (e.g. Secondary STEM teaching) through outreach and scholarships.

Pursue targeted growth of faculty, staff, and space resources

- Pursue opportunities for stable funding for research and professional development staff.

Seek innovative solutions to resource limitations

- Continue developing and expanding partnerships with schools to train mentors for pre-service teachers.

- Continue developing faculty expertise in K-12 education through partnerships with in-service teachers and schools.

How does this proposal support the University Mission and Strategic Objectives? *(Please refer to the [2018-2025 Strategic Plan](#) and indicate which core theme(s) this proposal will help achieve.)*

This proposal will support the following core theme(s) of the University Mission and Strategic Objectives:

- **Advance Inclusive Success**
 - Through continued professional development programs and workshops (e.g., Advancing Equity and Excellence in Science program funded by Howard Hughes Medical Institute Inclusive Excellence grant) designed to help STEM faculty members and TAs create inclusive classroom environments to increase the retention and persistence of all students, particularly low-income students and students of color.
 - Through work with departments and individual faculty members on creating welcoming environments and inclusive curricula to ensure STEM disciplines are accessible to all students and to reduce achievement gaps for students of color, low-income students, and non-traditional students.
- **Increase Washington Impact**
 - By building and strengthening partnerships with K-12 teachers, administrators, parents, Compass to Campus, and other organizations to ensure that all students can identify a pathway to becoming a STEM and/ or STEM teaching professional.
 - By working systematically and strategically with a variety of local and state partners to increase the diversity of the STEM/STEM teaching workforce by providing opportunities and experiences from pre-K through high school that allow students of color, low income students, and non-traditional students to consider futures in STEM and/ or STEM teaching. And highly qualified and diverse STEM teacher graduates from WWU help improve the quality of K-12 STEM education and serve as mentors to teacher colleagues and students, more of whom might pursue secondary education in STEM fields or STEM teaching.
- **Enhance Academic Excellence**
 - Through professional development and mentoring of STEM faculty members and TAs in the use of research-based, inclusive teaching and learning practices to ensure all students develop a deeper conceptual understanding of targeted content, particularly students who have traditionally not performed well.
 - By providing support to faculty members in the development of strong research, evaluation, and/or professional development components for grant proposals, as well as the implementation of those components when grants are funded.
 - By providing feedback from surveys and interviews with faculty members in order to monitor progress and assess the impacts of their grant-funded projects, and identify potential next steps.

What are the consequences of not funding this proposal?

- K-12 STEM education and partnerships between Western and schools within Skagit and Whatcom counties would suffer. Area schools have relied on SMATE faculty and staff to provide professional development in science and math to inservice elementary and secondary educators. SMATE professional development programs are well regarded in the region so principals and district leaders look to SMATE personnel for help determining the next steps for teachers' professional learning. Partnering with K-12 districts allows SMATE faculty and staff to learn about and help address current needs, while feeding that information into our preservice programs in order to ensure our graduates are prepared for the students they will teach. K-12 schools currently are requesting help with implementation of the Next Generation Science Standards (particularly the engineering and technology standards), Common Core State Standards in Math, and the new Computer Science teaching endorsement.
- STEM professional development for WWU faculty and staff would also suffer. SMATE has been at the center of professional development projects that have impacted significant portions of faculty members in STEM departments. While programs like the Howard Hughes Medical Institute's Inclusive Excellence project would continue, loss of educational research and professional development expertise would impact the quality of the program and require more time from current project leaders.
- Research and Evaluation related to K-20 STEM teaching, learning, and assessment would suffer. Over the past 15+ years Western faculty members have received help from SMATE staff with the education research, evaluation, and professional development components of their grant proposals and projects. During this time, SMATE has consistently been one of the highest external grant funding units on campus, supporting the success of numerous STEM faculty members in the College of Science and Engineering. Without the SMATE staff expertise requested in this proposal, Western would likely see fewer successful STEM education grant proposals submitted and funded by NSF, NASA, the State of Washington, and other funding sources. This in turn would result in reduced external grant funds to improve K-16 STEM teaching and learning in our region, less indirect costs funds directed to the university, college, and departments, and fewer opportunities for faculty research, scholarship, and publications. All of these have the potential to diminish WWU's reputation as a regional leader in STEM education and STEM teacher preparation.

What alternatives were explored?

For 15 years SMATE, CSE, and Western used a model of supporting these two positions solely through external grant funding. This model is no longer viable as federal and state funding models have changed. After discussing different options (with faculty, staff, and administrators), the staffing model proposed here, with support from the state plus external grant funding was deemed the most viable pathway forward to continue to provide this expertise and these services to our faculty, staff, students, and K-12 partners.

Which units (departments, colleges, etc.) will be involved?

The SMATE Staffing proposal will directly benefit faculty, staff, and TAs from the College of Science and Engineering, Woodring College of Education, and Huxley College of the Environment. It will also benefit K-12 schools in Whatcom, Skagit, and Snohomish counties.

Equipment needed:

Laptop for each Director

For major (>\$25k) purchases, please provide the following information.

Item:

Click here to enter text

Purpose:

Click here to enter text

Cost:

Click here to enter text

Anticipated Useful Life:

Click here to enter text

Replacement Cost if any:

Click here to enter text

Human Resources *(Complete the table below adding additional rows if necessary):*

<i>Position Title</i>	<i>Total Headcount</i>	<i>Total FTE</i>	<i>Salary and Benefits per FTE</i>	<i>Total Cost To WWU</i>
Director of Faculty Professional Development and K-12 STEM Partnerships	<i>1</i>	<i>0.75</i>	<i>\$90,659</i>	<i>\$90,659</i>
Director of Evaluation and Education Research	<i>1</i>	<i>0.75</i>	<i>\$95,969</i>	<i>\$95,969</i>

Table above should match data on budget spreadsheets submitted with this proposal. Complete the spreadsheet to get salary, benefit, and total cost amounts. Contact your division budget officer with questions.

Operating & Maintenance Costs (include service contracts, installation costs, etc.):

\$3,000 recurring in operating and travel. \$8,000 in one-time funds included for recruitment costs.

Space Requirements:

What type of space is needed for this proposal? (e.g., private office, lab space, group work/study space, etc.)

Private office for each Director.

What features must this space have? (e.g., fume hoods, plumbing, 3-phase power, etc.)

Desk, chair, bookcase, whiteboard

What needs can be accommodated within your existing space?

Space is currently available in SMATE

How much new space will be required?

None