Preliminary Proposal NSF INCLUDES: IM STEM Alliance
Design and Development Launch Summary

Never has the need for science, technology, engineering, and mathematics (STEM) workers been more critical to expanding our economy, ensuring our environmental stability, and maintaining our national defense capabilities. Yet, changing workforce demographics highlight a growing concern about the nation's ability to meet the workforce demands for a literate and skilled STEM workforce. Today the United States is faced with the most significant workforce challenges in STEM where women, African Americans, Hispanics, Native Americans, persons with disabilities, and persons with low socio-economic status are in STEM jobs at rates lower than their U.S. population representation. Federal laws, have long required state and local education agencies to eliminate discrimination, bias and stereotyping in federally-funded education programs. However, educators have been unable to demonstrate consistent performance and participation gains to close these equity gaps. Increases have occurred in academic STEM courses taken from 1990 to 2009, reflecting a national priority, but gaps between student subgroups have remained largely unchanged (NCES, 2013). In 2009, a higher percentage of Asian (54%) and White (31%) graduates had completed the combination of biology, chemistry, and physics courses than had their Black (22%) and Hispanic (23%) peers. Among graduates who had taken calculus, the average NAEP scale score was significantly higher for males than for females (197 vs. 190) (NCES, 2013). Females made up only19% of the AP computer science test takers in 2013. In 2013 SAT test results show a 32-point advantage for high school boys over girls (The College Board, 2013). In career and technical education (CTE) courses in high school that can introduce students to STEM careers, girls continue to show low participation rates: Architecture and Construction, 18%; Information Technology 39%; Manufacturing 19%; STEM 31%; and Transportation, Distribution and Logistics 13% (OVAE, 2012).

Changing these trends will require an "all hands on deck" approach that brings the capacity of many organizations from all aspects of the education spectrum. The National Alliance for Partnerships in Equity Education Foundation's (NAPE) NSF funded STEM Equity Pipeline has been working in 20 states using a collective impact approach since 2007. NAPE will partner with a diverse group of organizations from five states (CO, ID, NM, NV, and UT) to form the Intermountain STEM (IM STEM) Alliance focused on the goal of increasing the participation and closing achievement gaps in STEM education, including CTE. These organizations whose programs impact the formal STEM education system including: Departments of Education; Higher Education agencies; governor supported STEM Action Centers; universities; secondary school districts; community colleges; Department of Energy National Labs; non-profits and others. By employing a collective impact approach the participating organizations will create a common agenda, identify shared metrics, implement mutually reinforcing activities, and maintain continuous communication. The partners will identify effective practices focused on the common set of objectives and create a model to bring them to scale.

Initially, the IM STEM Alliance will pilot the scaling of NAPE's professional development (PD) programs - Program Improvement Process for Equity™ (PIPE) and Micromessaging to Reach and Teach Every Student™ (Micromessaging) - that have proven to impact equity gaps in STEM and CTE. The five participating states currently have small scale implementation of NAPE's PD programs and are interested in scaling these efforts. This design and development launch will provide the vehicle for identifying support mechanisms for scaling of the PD and the identification of additional scaling opportunities with other effective practices of the participating partners. These efforts will set up the partnership to develop an NSF INCLUDES Alliance by expanding the model to the 15 additional STEM Equity Pipeline states and other states wanting to scale the effective practices of the Alliance.

Intellectual Merit- The IM STEM Alliance's capacity to bring large well-resourced organizations to bear on the broadening participation challenges in STEM will advance the knowledge of how creative social innovations, like collective impact, can create transformative institutional and cultural change. The collection, evaluation and scaling of effective research-based solutions to close equity gaps in STEM will advance the fields knowledge and potential to create inclusion in STEM.

Broader Impacts – The lack of diversity of the STEM workforce continues to be a societal challenge of significant magnitude because of its impact on innovation, national security, environmental safety, and income inequality in the US. The IM STEM Alliance's mission to increase the diversity of students who are successful in STEM education will create a more STEM literate society, ensure the contributions of a diverse STEM workforce, and level the playing field for entrance into high wage STEM careers.