Hartnell College Office of Advancement and Development
Grant Pre and Post Award Form

October 2013

1. Funding Agency/Organization and Title of Grant Project			
National Science Foundation – Improving Undergraduate STEM Education (IUSE)			
2. Applicant		**Fiscal Agent**	
☒ **Hartnell College** ☐ **Other**		☒ **Hartnell College** ☐ **Other**	
3. Submitted	**Submission Date**	**4. Awarded**	**Award Date**
☐ **No** ☒ **Yes**	1/13/15	[X] **No** ☐ **Yes**	
If not submitted, why?	**Reviewer Notes Attached**		
on file			
Hartnell College Board of Trustees report date:	1/13/2015		

Abstract:

See attached project summary.

PROJECT SUMMARY

Overview. Hartnell College's Improving Undergraduate STEM Education (IUSE) project will implement, test, and evaluate strategies to increase/strengthen preparation and success of underrepresented/ educationally disadvantaged students in mathematics courses throughout the STEM pipeline resulting in improved transfer rates. It will do this through a research-based, redesigned instructional approach; upgraded Math Academy Plus programs; adaptive learning technology integrated with active learning inside and outside class; and using increased collaboration and engagement to better prepare students for transfer, graduation, and entering the STEM workforce. This project will also provide strong support for NSF's objective of *Integrating Diversity into NSF Programs, Projects and Activities,* as documented below. The project builds on, leverages, and integrates successful, but limited-scale academic support models at Hartnell.

The project is based on data indicating low college-readiness in mathematics gateway courses; lengthy transfer times; low transfer rates; and low graduation rates which, together, pose a major obstacle to student enrollment, persistence, retention, transfer and graduation in a STEM major at Hartnell College. This situation also poses an impediment for improving STEM diversity and developing the STEM professionals needed in the nation's industries and laboratories.

Hartnell College has developed objectives, strategies, activities and implementation plans that are informed by research so as to ensure success for Hispanic and low income students in mathematics and their STEM major. For example, the project team carefully examined the work of the National Survey of Student Engagement (NSSE, 2010), a national project to better understand the factors that affect student success and failure; and the Building Engagement and Attainment of Minority Students (BEAMS, 2008) project – a multiyear joint initiative that recommends student success initiatives be effectively *integrated* with each other and directly relate to mission and goals. The objectives for this IUSE focus on transforming the instructional, technological, and support environments in all math courses, in- and outside class, based on engaged, active learning principles and methods. Achieving the project objectives will result in the following measureable outcomes:

- 10 percent increase in STEM majors, overall;
- 15 percent increase math course success rates;
- 10 percent increase in math persistence and retention;
- 10 percent increase STEM transfers and graduations;
- Revised curricula, supporting active learning and integrating technology and online resources, in all major math courses;
- Improved/flexible math classroom, laboratory, and study facilities to support active learning.

Intellectual merit will be met by implementing a comprehensive, innovative approach to instruction and academic support that spans the STEM pipeline serving underrepresented and educationally disadvantaged students. The design, based on combining the latest research and best practices on improved STEM delivery methods, represents an improved way to successfully prepare, retain, transfer, and graduate STEM students from disadvantaged and underrepresented populations. Substantive evaluation data will support this criterion.

Broader impacts will be met by increasing STEM access and success for underrepresented, disadvantaged and other students, through a combination of improved instructional delivery, updated technology, group- and project-based learning, improved classroom configuration, and leveraging STEM support programs. Altogether, this will enable the faculty to better engage students to improve their level of preparation and achievement, and speed up advancement toward successful transfer to a four year program.