STUDENT ENTERPRISE TO ENHANCE CREATIVITY AND INNOVATION

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Project Objective/Educational Outcome

The primary outcome of this project is to create a learning environment to enhance student creativity and innovation through the integration of artistic creativity, entrepreneurial innovation, and engineering education.

Program Developmental History

The program builds upon a two-pronged development cycle. The first prong for this development began seven years ago when the Metallurgical Engineering department obtained a forge and anvil for students' extracurricular blacksmithing. With that basic equipment extracurricular blacksmithing on Friday afternoons soon became known as the "*Hammer In*" and continues unabated to this day. The adjacent figures show some of the products that students created at the *Hammer Ins* recently. Concurrently, blacksmithing was introduced into a series of Metallurgical Engineering undergraduate laboratory courses. The goal was to enhance the core scientific concepts between metalworking and microstructural development. All assessment measures showed increased student retention of critical structure-property concepts associated with the microstructural evolution associated with blacksmithing.

The second prong of the development cycle occurred within the undergraduate Industrial Engineering (IE) program. Concurrent with the Metallurgy curriculum revisions the IE program modified its entrepreneurial program by modularizing entrepreneurial components, creating a new course in innovation, and reorganizing the curriculum around an entrepreneurial certificate program. In addition to providing business plan support for budding entrepreneurs, a major goal of the program is to support and enhance intellectual diversity, and intellectual creativity in particular. The current project represents a confluence of these two prior curricular projects, geared toward widespread institutional change.

Learning Activities/Materials

The program has at its core selected courses where students will be introduced to program concepts. In addition, there will be a very active co-curricular component where students put into practice a wide variety of artistic/aesthetic and entrepreneurial skills in a real world setting through creation of student led creative design enterprise. The enterprise program will be housed under the student umbrella SIFE (Student Innovators for Free Enterprise) and will be called the Student Enterprise for Creative Design (SECD). The ultimate goal of the SECD is to enhance artistic design and manufacturing capabilities so that students can design, produce, and sell product that is of sufficient quality and creative design to sustain an ongoing student led creative design enterprise. Ten undergraduate courses from a wide range of engineering disciplines will be modified to include content relevant to the SECD program.

Additional "hands on" extracurricular activities beyond those described earlier will be added to support the SECD program. Specifically, extracurricular glassblowing and chainmaille programs will be added to expand the artistic component of SECD. The expanded extracurricular components will be piloted and assessed for viability and sustainability. The SECD will be organized formally as an integral component to SIFE. As such, the SIFE chapter will provide access to student conferences, entrepreneurial speakers, and business plan support. SECD will be an co-curricular activity within the SIFE chapter, and participation will be available to all students regardless of major.

Student work will be featured in the campus APEX Art Gallery once a year under the direction of Professor Deborah Mitchell (SECD Artist in Residence). The purpose of the exhibit will be to provide students an outlet for showcasing work that has artistic merit, highlight the importance of aesthetics as part of the creative design process, and to provide a visible public outlet for students engaged in creative design.

In addition to the annual SECD art exhibit, students will be able to design, produce, and sell individual or production pieces to university alumni and to the general public. The SECD program has two major goals: (a) to enhance creativity in product design and (b) to enhance student engagement and interest in innovation and entrepreneurship. By organizing the SECD within the SIFE umbrella, students will have access not only to local campus support (student association funds) but to a number of national, regional, and state competitions that support student creativity, innovation, and entrepreneurship.

Execution of the SECD Program

Given the intent for institutional change, the SECD program will involve multiple faculty. Dr. Jon Kellar, will be responsible for overall program management. Dr. Stuart Kellogg will be responsible for the student entrepreneurial portion of the SECD. Professor Deborah Mitchell will serve the role of "Artist in Residence". Within this role Professor Mitchell will serve as a professional mentor for the artistic/aesthetic student components described above.