# 2006-2224: UTILIZING INDUSTRIAL PARTNERSHIPS TO CREATE SUCCESSFUL GRANT PROPOSALS

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# Utilizing Industrial Partnerships to Create Successful Grant Proposals


## Abstract

Gants proposals are facing increasing competition for the ever shrinking amount of available funding. This reality requires new partnerships to be formed to attract the attention of funding agencies.

The necessity of finding new or improved ways to attract the attention of funding agencies has resulted in symbiotic relationships that not only enhance the funding of a proposal but develop relationships that can add great opportunities for curricular improvements, greater relevancy, and better job opportunities for students in Engineering Technology Programs.

This paper relates Eastern Washington University's experience of creating and using Industrial Partnerships to submit a successful grant proposal to the Society of Manufacturing Engineers (SME) for over $221,000. The Industrial Partnerships formed for this proposal were one of the key factors sited by the Society of Manufacturing Engineers Educational Foundation in awarding the grant to Eastern Washington University. The paper also details the many benefits beyond the grant funding that Eastern Washington University's Mechanical Engineering Technology and Manufacturing degrees will enjoy. These relationships forged during the grant process are certain to reap benefits to the university for many years long after the conclusion of the two year grant. The Industrial Partners have become part of a steering committee for the programs that will continuously help improve the program, improve program outcome assessments, encourage regional companies to offer paid internships to students and allow our graduates to meet the needs of the regional industry.


## Introduction

Universities face a daunting challenge in the current and future economic times. State funding is decreasing at historic proportions.[1,2] State supported universities are seeing a decrease in funding per full time equivalent student (FTE).[3,4,5] Universities are finding that the state funded percentage of the total cost of educating each student is decreasing and in fact funding is at a 25 year low.[6] This has had a drastic effect upon academic departmental budgets resulting in less money to fund laboratory equipment. This problem is further compounded by a decrease in capital expenditures for new buildings and laboratory facilities for undergraduate education by state governments. This has been caused by the tight financial budgets of states as they look for ways to cover budget gaps. The decrease in the state university funding shortfall is even worse in Engineering and Engineering Technology programs. Technology has continued to evolve and increase in complexity requiring new laboratory improvements to ensure that students are properly educated and prepared to enter the new global workforce. The need for new and better facilities during a time of decreasing funding was a real challenge for Eastern Washington University. The Engineering and Design department of Eastern Washington University was housed in a 40 year old building with equipment that in some cases predated the building. The age of the facility and the inability to upgrade the facility to meet the needs of students led to

curricular problems particularly in the Mechanical Engineering Technology and Manufacturing programs. The students were not being exposed to modern technology in the laboratories. Several national competency gaps identified by the Society of Manufacturing Engineers were not being adequately addressed.

Eastern Washington University needed a new building and new state-of-the-art laboratories and equipment to provide a better student experience. The prospects for funding were grim. The university took the bold step to propose to the state legislature that if they would fund the building that the university would find funding to equip the building. The legislature ultimately agreed. Eastern was then faced with coming up with grants to equip the building. The Society of Manufacturing Engineer's Manufacturing Education Plan (MEP) grant program met both of Eastern Washington University's curricular revision needs and funding needs to help with the purchase of some of the equipment needed for the new laboratories. After review of the MEP grant guidelines, it was determined that in order to develop a grant proposal that would be favorably looked upon industrial partnerships would need to be formed. The SME, like many other funding agencies, was looking for ways to leverage the funded dollars with other money such that the impact of the grant on the institution receiving the grant is much larger than the dollars given to the institution direct from the funding agency. Eastern decided to involve the regional industrial partners to show the larger impact that the funding agency's money would have on the Manufacturing and Mechanical Engineering Technology programs. Forming the industrial partnerships allowed EWU to be successful in receiving a $221,000 grant to do curricular revisions and purchase some much needed equipment to upgrade the laboratory experience for our students.

**The Grant Process**

The grant process consisted of four sequential steps. The first step consisted of developing the grant proposal. This was a joint effort between EWU's grants department and professors Richter and Donnerberg in the Engineering & Design department. During this time an outline for the grant proposal was developed and specific portions of the grant were assigned to each member of the group. Periodic meetings with the group were conducted to make sure each member was on task and to evaluate the work being done. These periodic meetings proved to be very beneficial because it allowed for different perspectives to be injected into the grant proposal.

Step two of the process was to contact local industry to see if they were willing to support EWU with the SME grant. This required participating industries to write a letter of support and verbally agree to provide internships for the students in the Manufacturing and Mechanical Engineering Technology degrees. We received excellent support from over 20 industries representing diverse areas of local manufacturing.

Step three consisted of making final revisions to the grant and then submitting it to SME. This included the letters of support from local industry. EWU was selected as one of the finalist for potential funding after the initial review.

Once notified that we were one of the finalists, we were informed that a group of three representatives from SME were coming for a site visit. Preparing for and conducting the site visit

was the final step of the grant process. During the visitation the representatives met with EWU's President, Provost, College Dean, School Director and members of the Engineering and Design department. A special meeting was also conducted with our industrial partners. During these meetings the SME representatives asked specific questions pertaining to the manufacturing programs and local industry. The three representatives gave their recommendation to SME headquarters. Their recommendation was to fund the grant proposal.

**Forming Industrial Partnerships**

The Department of Engineering and Design at Eastern Washington University formed multiple partnerships with local manufacturing companies while applying for the SME's MEP grant. Through our experience we discovered that most regional manufacturers are more than willing to form a working relationship with an educational institution. All that was required was to ask. Manufacturers believe that they can benefit from a good working relationship, in that it will produce a future competent workforce, helping them to stay competitive in the world economy. Forming industrial partnerships is very beneficial and should be considered indispensable for any institution that offers technical degrees.

The industrial partnerships that we formed included a wide variety of equipment manufacturers such as HVAC, electronics, packaging, recreational, safety, food processing, composite manufacturers, and various metal manufacturers. The diversity of industry appeared to have a positive influence with SME, helping to solidify the grant.

Partnerships were formed to provide three fundamental items: a steering committee consisting of industrial representatives and faculty members, internships and senior projects for the Manufacturing and Mechanical Engineering Technology majors. The steering committee is designed to direct the curriculum and establish instructional goals so that student learning is relevant to today's industry, thereby creating a workforce that meets the needs of regional industry. It is a viable method by which to keep programs abreast to current technology used in industry. In any technical program a strong effort should be made to reduce the distance between education and industry.

The internships are designed to provide the students with "real world" experience before finishing their degree programs. This is typically done by requiring the intern to become involved with at least a portion of the production process at the manufacturing facility. Interns will learn first hand about the manufacturing processes utilized by the company. It also allows employers to survey potential employees before hiring them. Internships are a win-win situation for both the individual and the manufacturer.

The final item formed by the industrial partnership was the development of senior projects. We discovered that most manufacturers have at any given time "pet projects" that would be very beneficial to the company if they could be addressed. However, this usually requires extra personnel, time, or even a reduction or stoppage of production. Most manufacturers cannot afford to stop production in order to increase the efficiency of the process. Students working on a senior project can typically progress with the project without disrupting the main production process.

An example of a typical progression of a relationship with an industrial partner is the case of a local manufacturer of mountain climbing equipment. We started with conversions about our program and invited them to become more active with the department. The relationship grew and the company agreed to hire a student as an intern from the department. The company interviewed students and hired a student to work for them part time. During the students internship the student mentioned that he was taking the robotics and automation course and that his lab team had to come up with a project to design and demonstrate to the other teams. The student, after discussion with the company brought into the class a "real word" automation project that the company was considering doing. The company even provided machining time and materials for the end-of-arm tooling on the robot in the lab. The students used the actual press tooling and mocked up the presses in the lab and then developed the application and design for the robot to tend two presses simulating a work cell. This mockup allowed the situation to be addressed without interrupting actual production. During the demonstration the owner, CEO and two engineers from the company came to the lab and viewed the demonstration. They were very impressed. The company discussed ways to improve the process and is looking at implementing the design. The point here is that by trying to engage the industrial partners with the department we have lead the company to be very happy with, and interested in the departments programs and students.

We have used this approach with other companies getting them involved and encouraging them to bring us real world problems that can be used as part of the course work for students. We have found many of these companies are very willing then to spend time on the department's steering committee/ advisory committee. Forming these relationships often leads to internships, supplying raw materials for student projects and full time hires of our graduates.

Our regional industrial base is very broad and the question can be raised as to how we meet the needs of such a diverse group. We do this through our steering/advisory committee for the department. Through this committee the industrial partners from industry talk and agree on what they would like us to add/change in the degree programs.

In this way we get a consensus view of needed changes to keep the degree programs relevant to the needs of industry. I agree that doing this we produce graduates with a more broad background than a narrow focus for a particular industry, but it also allows the student more varied opportunities for employment and career growth. This flexibility has value not just in our region but nationally as particular industries changes due to changes in our global economy.

**What Funding Partners are Looking For**

Funding agencies have a variety of grant proposal characteristics they look for. First and foremost the funding agency is looking for a good investment on their money. The proposed project must have tremendous face validity and a high probability of success. The Society of Manufacturing Engineers was very interested in knowing what kind of positive impact the grant proposal would have on the local economy and the specified programs at EWU. Questions about program enrollment, curriculum changes, workforce needs, and types of local industry were asked by SME.

SME required both in-house and outside support from industry in order to fund the grant proposal. They are very interested in acquiring matching dollars. In-house support comes directly from the institution and can include hard money, salary for release time, and money for temporary positions that do not exist at the present time.

Support from industry must include more than just the volunteering of time by industrial partners on the steering committee. It must also include financial support from industry. This financial support may include anything from guaranteed paid internships for students, paid externships for faculty, equipment donations, or just hard money. Software donations are also viable but don't seem to carry the same weight as the other items listed.

**SME Grant**

Local industrial partners verbally agreed to provide $43,000 dollars worth of internships and $30,000 worth of scholarships to our students over a two year period. The partnerships would initially support the grant proposal and more importantly develop a long-term relationship with the Engineering and Design department reducing the gap between industry and academia.

The grant is designed to elevate manufacturing education at EWU. This included adding a manufacturing option to the current Mechanical Engineering Technology and revitalizing the Manufacturing Technology program.To accomplish this task, the manufacturing program will be promoted by the department to local high schools and community colleges, necessary modifications will be made to the curriculum, new courses will be added, and state-of-the-art manufacturing equipment will be obtained.

The grant specifies that each manufacturing course will be analyzed for course content and intended learner outcomes. Two new courses consisting of CNC and technical communications will be developed and added to the program. Also, a senior project and internship or directed study will be added to the requirements.

A total funding of $195,000 is provided by the grant to purchase state-of-the-art manufacturing equipment. This includes a CNC water-jet cutter, a CNC plasma cutter, a CNC turret lathe with a 12 position tool turret, a sinker EDM, and a coordinate measuring machine. An additional $9,700 is provided by the grant for necessary tooling and $4,500 for acquiring additional software used in manufacturing.

**Conclusions, lessons learned and future plans**

Eastern Washington University's experience in forming industrial partnerships to attract funding was very successful. The money will be used to buy much needed equipment and revise the manufacturing and mechanical engineering technology programs. The industrial partnerships will become an integral part of the culture at EWU. These partnerships have already resulted in several paid internships for our students. This is allowing our students while attending college to

experience what it is like to work in the field as well as the ability to be mentored by practitioners in the field. EWU has learned that the relationships with its industrial stake holders cannot and should not be a one time effort. The relationships, guidance and dialogue between the regional industry and the department's faculty will continue. EWU is convinced that the on going relationships formed by the partnerships will help EWU find funding for future initiatives.

The outgrowth of this collaborative effort has been the increased involvement of industry in the program. The dialogue created by the industrial steering committees which were formed as part of the initial grant effort with the SME has been invaluable to the department's programs. Eastern Washington University suggests that other universities strive to form these symbiotic relationships that will not only enhance the funding prospects of a proposal but develop relationships that can add great opportunities for curricular improvements, greater relevancy, and better job opportunities their students.

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