



OPAS Steering Committee ETIC Proposal Writing Task Force Internship Summary by Cresswell & Horton February 23, 2008

On January 18, 2008 Bruce Schafer, Dick Knight, Ben Manny, Eda Davis-Lowe, Eileen Boerger and Jo Oshiro met to discuss how to put together information for a written, comprehensive proposal to ETIC that captures the essence of the presentation given on February 8, 2008 and the written sub-proposals in hand and under development. **We need to ensure we focus on the E in STEM, (Engineering, Computer Science, and Materials Science) as that is what ETIC wants to buy.**

Please, as authors of subproposals, review your proposals and respond (email to Jo) to these bullets in no more than one or two pages:

- Paragraph characterizing the elements of your exemplar program. See "Investment Description"
- How is this program likely to deliver more well-prepared college freshman choosing engineering, CS, or materials science?
Building on the work of the other elements of the proposal, student internships are important culminating events, especially for the highly motivated, "low hanging fruit."
In helping to 1) connect classroom learning to future careers in engineering and 2) generate excitement for the math and science required to pursue those careers, educator internships provide a valuable link in preparing students for college engineering programs and laying the foundation to persist in their studies.
(See Vision Statement)
- How does this program achieve sustainable systemic change – that is, change that will outlive the OPAS committee structure and its solicitation and oversight of allocation of ETIC funding.
In addition to the systemic change resulting from other elements of the proposal, this piece will create a culture of mentorship in corporate Oregon. Companies will co-fund the program from the beginning and will ultimately fund it entirely. They will be willing to do so because the student interns that come to them are so well prepared through the other elements of the program and the educator interns are valued not only for their productive contributions, but as an effective catalyst for increasing the engineering pipeline.
- Delineate the balance of quantity, quality, and diversity
Numbers will rise as more students are prepared in high school and employers see what high school students can do. If we focus PLTW on low income schools and schools with high underrepresented populations, those students will be prepared to compete for internships with students from wealthier schools, even private schools. This is leveling the playing field, making the ultimate brass ring of internships accessible to all. With a track record of 75 - 85% of engineering interns choosing engineering majors, the internship experience will "seal the deal" and should hugely impact undergraduate enrollment by our target populations.

Educators are a highly leveraged resource. A single teacher intern will affect 150-180 students each year. Intern candidates will be recruited from schools throughout the state, representing rural and urban populations as well as students of color, and other under-represented youth such as those on free and reduced lunch programs and those with physical disabilities.

- Describe how to stage the growth in terms of geography, types of schools, target student audiences

Student internship recruitment will follow the PLTW schools. Educator recruitment will align with demand from businesses sponsoring the engineering-related internships. The Business Education Compact will build on its statewide presence, with a special focus on organizations participating in National Engineers Month, as they have already demonstrated an active participation in building an engineering pipeline.

- The criteria question – to allow us to write the proposal “un-branded” to correctly follow procurement rules as a state agency – some ideas to consider:

- Why you picked a particular “brand” – what qualities, metrics, strategies, resources make it an exemplar program; if you think they are missing a piece, by all means include it.

Saturday Academy and the Business Education Compact meet all the criteria in “Investment Description”

- What the metrics are and/or should be See “Metrics Forecast”
- What qualities/resources demonstrate that a particular organization can deliver the program

Saturday Academy and Business Education Compact are well-established and well-respected organizations in the community with an extensive history of delivering quality internships (19 and 23 years respectively). They have well-developed infrastructures and dedicated outreach staff.

- Delivery vehicle/model

Saturday Academy ASE program model:

- Students are recruited by SA
- Mentors are recruited by SA
- Students apply to internships
- Mentors interview students
- Mentors select students
- Mentors deliver 8 week internship during summer
- Students attend two summer conferences, one a career conference and one a technical conference

Business Education Compact Educator Internship model:

- BEC solicits business participants (leveraging relationship with organizations already participating in BEC’s National Engineers Month program)
- Business creates engineering-related job description
- BEC advertises/ recruits candidates and screens for qualifications
- BEC arranges interviews with host organization
- Business mentor interviews and selects educator intern
- BEC serves as employer of record
- Internship length averages 5.5 weeks
- Educator completes “Career Related Learning Plan” on completion of internship; its purpose is to translate the work experience to improved curriculum and help students understand the field of engineering and what’s required to prepare for a career in the field.

- What are your metrics? How do they relate to ETIC interests?

Student internships. See “Metrics Forecast.” By 2020, there should be 127 students per year declaring engineering majors in their freshman year. That assumes our historical conversion rate of 75% has grown to 85% because the kids are so much better prepared. To the extent we work in low income schools, a higher proportion of those students will stay in Oregon for college than is now the case (24%). Until we see the make-up of the schools that select PLTW, any target is just a guess, but I would think at least 75% of the PLTW students would stay in state if we truly work in low income schools. I have added a metric to this effect, but it’s pretty rough and it totally depends on the socio-economic status and demographics of the schools that buy in to PLTW.

Educator internships. See “Metrics Forecast.” The BEC plans to build on year-over-year program success and grow the number of engineering internships with each biennium. These opportunities will supplement the educator’s academic credentials with the critical real-world experience essential to make them most effective in the classroom. Because educators typically reach 150-180 of students each year, the cumulative impact of a growing number of teacher internships over time is substantial, as the chart below indicates.

	Number Educator Interns	Number Students Reached
2009	10	1,500-1,800
2010	10	3,000-3,600
2011	20	6,000-7,200
2012	20	9,000-10,800
2013	30	13,500-16,200
2014	30	18,000-21,600
2015	35	23,250-27,900
2016	35	28,500-34,200
2017	40	34,500-41,400
2018	40	40,500-48,600
2019	50	48,000-57,600
2020	50	55,500-66,600

Teachers return to the classroom with a plan of action (a requirement of the internship). Their responsibility is to simply make learning relevant for their students. That includes increasing awareness of the opportunities in the field; developing student understanding of the curriculum requirements to prepare for success and college; helping students in their assessment of career options; and generating sufficient enthusiasm to excel and persist in the coursework necessary to prepare for an engineering career.

The group brainstormed some metrics; this list is centered on Out of School Time (OST) High School programs, but may provide some inspiration for other programs and so is included here.

- Did the program work? (e.g. Did the school district agree to pick up the stipend? Did the club become self-sustaining through dues?) “Did it work” and “Is it sustainable” are pretty different questions!
- Number of such programs/sites/teams implemented.
- Number of students participating. In our metrics
- Contact hours per student. In our metrics
- Numbers matriculating in engineering in at university in project year 2, 3, 4 ...

See our metrics. To get the numbers of students, take the number for the listed year, divide by 2 (because these are biennial numbers), and multiply by the conversion rate listed. So in the 2020 biennium, we would serve 150 students per year x .85 conversion rate = 127. If 75% of those choose Oregon schools, that's 95 kids.

- Increase in scholarships awarded to student participants.
- Enable longitudinal tracking in some way (try to hold all of our students to this standard). We're willing to participate in this, but haven't written particulars into our proposal. To a large extent, the interns are the easiest ones to track because they have the most intense experience.
- Number of participants seeking multiple engineering and applied science in- and out-of-classroom experiences beyond the target program.
- Number of adults engaging with participants.
This is in our metrics as number of participating companies.
- Number of near-peers engaging with participants.

Dick Knight will provide a short introductory piece on the need and current status of engineering and applied science in Oregon, framing the need for the six sub-proposals.

*Respectfully submitted,
Jo Oshiro
February 18, 2008*