

## **OPAS Motivate Workgroup Meeting #4 June 7, 2007 – Agilis Solutions, Beaverton**

**Attendees:** Bruce Schafer (OUS/ETIC), Eileen Boerger (Agilis), Ben Manny (NOISE), Mary Beth Horton (BEC), Karen Lakin (Saturday Academy), Ray Vandiver (OMSI), Ryan Collay (SMILE/OSU), Joyce Cresswell (Saturday Academy), Endi Hartigan (OUS)

### **Summary as emailed and posted June 8, 2007**

The most recent meeting of the Motivate Workgroup was an extended work session hosted by Agilis Solutions on June 7, 2007.

Bruce Schafer joined us to report on legislative, ETIC, and steering committee activity. ETIC's strategic goal is to double the 1999 number of OUS graduates in engineering and applied sciences: that goal is 40% met. Limiting factors are campus infrastructure, faculty, and motivated, prepared freshman. Research has seen an 80% increase, far from the ETIC goal of a 5x increase in research funding.

- In the 2005-2006 biennium \$751K was awarded in support of OPAS recommendations and goals. That number will increase in the next biennium, divided across 2 solicitations for proposals, one limited to OUS campuses.
- Summaries of OPAS workgroup activity and the slate of campus proposals for ETIC pre-college programs were distributed.

While reporting on subgroups (Connecting with Volunteers, Connecting with Businesses, Connecting with NOISE) workgroup members had a wide ranging discussion:

- models for volunteer participation – is SMART applicable?
- Internships
  - Difficult from the business side, especially for small to medium companies, which most in Oregon are.
  - An internship is still an ideal model of a high-quality educational experience with great potential for recruitment of future engineers and scientists.
- We agreed we should not force the connection of getting Oregon high school kids into OUS schools.
- National Engineer's Month
  - Recruitment piggybacked on to the wrap-up survey looks successful so far.
  - Eileen and Mary Beth will pick through what's available to develop 3 grade-targeted frameworks for presentations for each engineering discipline. Jo will forward some resource links. We may have access to a classroom teacher this summer who can help with this effort.
- An ideal project: work with NOISE to package curricular units with connections to regional informal providers, CRLE, and 3<sup>rd</sup> year high school science and math requirements. This would need staffing, perhaps a BEC educator intern, and funding for same.
- Ben and Jo are ready to discuss the volunteer survey with OMSI's evaluation department.
- School districts, not coordinating agencies, have a better idea of the demographics of participants in school-to-work programs.

The next meeting is scheduled for July 11.

### **Action Items as emailed and posted June 8, 2007**

- (Jo) Review and re-post undone action items from May 9
- (Ben, Jo) Meet with OMSI to polish survey instrument for volunteers, gain insight for future surveys.
- (Ben) Summary of volunteers subgroup breakout to Jo
- (Eileen) Summary of businesses subgroup breakout to Jo
- (Jo) Send out emails for clarifications on notes; Perkins dollars,
- (Ryan) Review the Phase Model for any disconnects of terminology with educators.
- (Jo) get leads on websites with engineering curricula and info to Eileen and Mary Beth.
- (Eileen, Mary Beth) Develop frameworks for NEM presenters.
- (Jo) Connect Endi to PTE Regional Coordinators
- (Jo) Get volunteer survey link to Karen
- (Ray) Does OMSI have a listserv or other way to administer this survey to its adult volunteers?
- (All) Expect more action items and questions as Jo collates the breakout sessions

### **Additional Points of Discussion, Information, and Resources**

Introductions:

- Ryan Collay from SMILE at OSU. The SMILE program covers grades 4-12; currently 750 students, 250 of whom are middle schoolers; 75 teachers; 35 schools of which 10 are elementary, 13 are middle, and 12 are high schools. Ryan has extensive programmatic, event, and classroom experience, as well as several kids of his own spread over a wide age range.
  - Two of the teacher's at Beaverton's new STEM magnet school are former SMILE Teachers.
  - SMILE has a partner relationship with the CMOP (Coastal Margins Observations and Predictions) center which includes OHSU/OGI.
- Mary Beth Horton of the BEC notes that the numbers are in on National Engineers' Month 2007: the BEC put 250 engineers in to 600 classrooms serving 16,000 students. The TechnoScienceSupersite now has its own URL - <http://www.technosciencesupersite.org/> and greater PR efforts are underway. The BEC's strategic relationship building with IEEE continues; she will meet with their board in mid-June.
- Karen Lakin, Saturday Academy Board member and volunteer visits today to discuss her experience with volunteering and connecting to businesses. She has been recruiting additional businesses to host ASE internships. She came to Saturday Academy's ASE program because of her son's excellent experience as an ASE intern.
- Bruce Schafer reviewed ETIC funding status and plans. OPAS Steering Committee activity centers on alignment, coordination, and collaboration among stakeholders, advising ETIC on RFP processes, and working towards finding additional funding.
  - Ryan: A track record of collaborative partnerships is a big lever for funding, so OPAS work on this front is valuable.

- ETIC metrics count degrees at 8 campuses, excluding those educated out of state. OPAS metrics need to consider to what extent resources should be spent to measure success.
  - While being respectful of using state funds, we should not force the connection of getting Oregon high school students into Oregon colleges and universities. Community Colleges need to be included. Many OPAS recommendations will “float all boats” which will include a top tier of students leaving the state for private colleges. Improving the reputation of Oregon institutions will ameliorate this, but is a longer-term strategy.
  - ETIC directly addresses infrastructure and branding issues of OUS campuses; OPAS targets addressing the supply of motivated and prepared freshman for those campuses.

#### Meeting Plan:

- Ben: our goal for today is to cement things before summer, review activity among the three subgroups and other arenas to avoid duplication of effort.
- Ryan: We need to identify who is missing from this highly networked group of people.

#### Resources Mentioned:

- TechnoScienceSupersite: <http://www.technosciencesupersite.org/index.html>
- Coastal Margins Observation and Prediction Center: <http://www.stccmop.org/>
- Educator Champion Challenge: <http://www.e3oregon.org/ecc/>

#### Subgroup Report & Breakout Session: Connecting with Volunteers (Ben, Endi, Karen)

- Ryan: Finding adult volunteers is the single biggest headache.
- Ben: It is time to meet with OMSI about polishing the volunteer survey. On many fronts we are still in factfinding mode. We want to develop models of what works for volunteers.
- SMART as a model:
  - Joyce: Lack of content preparation needed by SMART volunteers may mean it is not a good model for STEM volunteers.
  - Ben: In working with the Lemelson InvenTeam at Hilhi, the content preparation is negligible; I am teaching a problem-solving approach.
  - Bruce: it may be useful to map volunteer programs in several dimensions of training, preparation, and demands. For purposes of motivation, it is not always necessary for the participating student to emerge from the experience with a deep understanding of physics. The caring, one-on-one relationship may be more important.
- Ben's Notes of the Breakout Session:
  - **Saturday Academy Discussion:** Karen from Saturday Academy described her experiences in recruiting ACE internships
    - Internships had dropped from 200 at the time of the dotcom highpoint down to 75
    - By focusing on company contacts she has managed to build the number back to 125 over the last year.
    - The internships are targeted for High School Juniors
    - Internships are 8 weeks of full time (40 hours) work at the company

- Include two for the Intern conferences
- Pays a stipend to the Interns
- While the focus of internships is business based, institutions like OHSU that employ teaching faculty are easier to work with to set up these 8 week internships. It was suggested this might be a more fruitful area to pursue, especially in areas served by a major campus or possibly Community Colleges could be considered. This would only work if the school had a sponsor for the intern stipend, which could come from a business, foundation, or even an individual.
- Karen also mentioned the Saturday Academy instructors are paid a stipend. So while Karen is a SA volunteer herself and is working hard to expand the ACE internship program, this expansion is NOT focused on recruiting adult volunteers. A take away is that for SA most adult volunteer work is in providing the infrastructure of the program. Ben took the action item to send Karen a pointer to the adult volunteer survey so Karen can provide feedback on the survey.
- **Volunteer sub-group goals**
  - We affirmed our goal to build some effective models of recruiting and retraining adult volunteers, based on the survey. We identified the following groups to survey in addition to volunteers working on other OPAS connected projects (e.g. ORTOP, National Engineering Week, NW Science Fair):
    - SAO
    - IEEE org.
    - School volunteer coordinators
  - This discussion also raised awareness on other channels to recruit adult volunteers besides directly asking them. These include:
    - Business channel - Work with companies to get them to recruit volunteers from their work force
    - Academic channel - Work with schools and their volunteer coordinators. It was noted that many schools email weekly newsletters to parents that list volunteer opportunities.
    - Civic Organizations - Work through Chamber of Commerce, which in turns works with business & schools. Oregon Business Council may be a good place to pitch getting business to increase adult volunteers.
  - We discussed the need to survey school personnel on how they recruit and retain adult volunteers. Some of this information is already being compiled by committee members having discussions with these personnel. Barriers often exist at schools to make it hard to volunteer. Members will continue to gather such information but we did not commit to a survey at this time. After developing models to help recruit and motivate volunteers, we may need to address existing barriers in classrooms that discourage adult volunteers.
- **Other discussion points noted**

- Adult volunteers generally have no time to prepare to volunteer. Members believed this was one reason programs like SMART were successful. The program is set up to make it very simply and easy to volunteer.
- PTE Regional Coordinators would be a good resource to identify existing barriers in classrooms to attracting and retaining successful volunteers. No action items were taken, but Don Domes may be able to help with this one.
- Based on our discussion and Ryan's introduction question to the group on "Who are we missing?" we may want to invite a representative for a Community College and a Chamber of Commerce to join the Motivate group,

#### Target Audience and Message

- Joyce: What happened to our dream of getting educators to view engineering as another content area?
- Ryan: engineering is a process by which we learn lots of content; engineering should be taught in the sciences, fine arts, and math.
- Ben: CTE (Career and Technical Education, formerly known as Professional Technical Education, a more rigorous and relevant outgrowth of Vocational Education) provides one avenue for teaching engineering; PTE teachers must have real-world experience.
  - Bruce: CTE can be tied to federal Perkins dollars and the new high school graduation requirements. The graduation requirements "essential skills" include problem solving; engineering fits there. A new design team is being emplaced to figure out what "essential skills" means, how to teach them without adding new courses, and how to assess them. Best practices need to be more consistently applied across the state.
- Ryan: many kids are metaphorically making the decision to drop out of school at ages 11-12 (7<sup>th</sup> graders). 4<sup>th</sup> graders are probably the right target group.
- Ryan: We need increased awareness of the need for teacher preparation; they need to come out of college with an increased ability to teach problem-solving, team-based learning, and how to integrate these into curriculum. We also need a public school system that enforces that.
- Jo/Ryan: The Phase Model discussed at the first Motivate meeting may be unclear to educators because of language issues. Ryan has a reference for a similar, widely used model.
  - Ray: NOISE currently focuses on the provider perspective; the original Phase Model is from the end-user perspective.

#### **Subgroup Report and Breakout Session: Connecting with Businesses**

(Eileen, Mary Beth, Joyce)

- Internships and CRLEs (Career-Related Learning Experiences)
  - Joyce/ Mary Beth: One way to keep top-tier students at home is via internships that connect them to companies or campuses for one and often several summers.
  - Bruce: Internships are hard to scale, and a poorly managed internship that has a student doing menial work or data entry can be de-motivating.
  - Eileen: From the business side, an internship is a lot of work in planning, supervision, and management. Oregon's smaller companies – most of them –

don't have the time, money, or people to do an internship. If you calculate Intel's ratio of interns/ employees, it is not a large number.

- While retaining internships as an ideal, we need to also look at job shadows, career fairs, and other models of exposing students and businesses to each other, while realizing each of these models has its issues.
- Eileen: we will track the progress of volunteers identified in the post-NEM survey to measure our goal of increasing NEM participation.
- Also working on using current NEM company participants to recruit additional companies via a partner program and a referral program.
- To further reduce barriers, we will pick through available curriculum resources and develop 3 frameworks for classroom presentations across engineering disciplines and engineering processes for various age/grade levels.
  - Ryan: be aware of likely subjects/classes being taught at each level.
- Mary Beth: businesses are identifying pipeline issues as a problem, and that the new graduation requirements dictate the need for a CRLE, but getting the two together is a continuing frustration. An external force – a tax credit? may be needed. Sometimes the need for local control in education devolves into something more like parochialism.
- The lukewarm response to the Educator Champion Challenge shows that PR hooks are not what will get businesses to bring volunteers to the classroom; we need other ways to make it easy. Because of Ben, she now talks to everyone about retirees.
- Ryan: The Chalkboard Project documented a distrust of education. We must make the focus be STEM education as a positive. The more educated a community is, the more money is out there.

#### **Subgroup Report and Breakout Session: Connecting with NOISE (Ray, Ryan, Jo)**

- Ray: NOISE leadership is currently talking about that common credo; creating common language, mind maps, and understanding based on a vision of collective collegiality. NOISE as mission-driven colleagues with common goals – not competitors, and looking to NOISE to inspire each learner to participate in at least two informal STEM education opportunities per year.
- An ideal: a network of local and across-state providers that can tie their informal STEM experiences into local classroom curricula and/or allow students and teachers to connect to additional resources (mentors?).
  - Mary Beth: Could ODE's renewed focus on credit by proficiency tie in to informal STEM education? If funding were available, BEC could work with NOISE to provide an educator intern to work with packaging curricular units with connections to informal providers to address CRLEs, 3<sup>rd</sup> year high school lab science requirements. BEC also provides some Credit-By-Proiciency (CBP) best practices through a workshop.
  - Eileen/ Ray: CBP is a big data problem, especially in the assessment piece. Tests? Portfolios?
- revisit Ed Dennis' awareness policy of "engineer"
- informal settings are more integral than anybody ever realized
  - gather words, focus, feedback from students
- common language, metrics, mindmaps
  - professional development
  - enrichment models

- alignment
- explicit about STEM learning that's behind the fun of informal experiences
  - PR problem with perception of science, especially math, STEM careers
  - PR campaign for STEM – partner with Weiden and Kennedy?
- Articulate a story grounded in data
  - All data formative – capture within the program, more important than summarive
- Story of how participation in NOISE can be sold to non-profit boards, funders, members, others
  - NOISE is the tide that floats all boats