OPAS Motivate Workgroup Meeting #1
March 1, 2007 – PSU EB 500

Attendees: Jo Oshiro (OUS/OPAS), Eileen Boerger (Agilis Solutions), Ben Manny (NOISE), Endi Hartigan (OUS/ Communications), Mary Beth Horton (BEC), Joyce Cresswell (Saturday Academy), Bruce Schafer, Roger Rennekamp, Don Domes, Sue Ann Bottoms, Ray Vandiver, Kathryn Schwartz, David Coronado

Italics indicate activity since the meeting.

Summary

Co-chairs Ben Manny and Eileen Boerger presented a conceptual model – the Phase Model - and a straw proposal to inform and direct the Motivate Workgroup's activities for 2007. The Phase Model divides program/content delivery and its effect on motivation into:

- Awareness
- Encounter
- Engagement
- Commitment.

The straw proposal had three actions, all of which were ratified by the workgroup as a whole. We then divided into breakouts to further discuss these areas and develop specific action items and metrics:

- Increasing volunteers in the classroom (Ben, David, Endi, Don);
    - Survey
        - (**Ben**) Investigate surveying Intel volunteers both (current and retired) who log more than 100 hours/year
        - (**Ben**)Tap into Intel Retirees as a source of potential classroom volunteers
        - (**Endi**) Check with Di on PR coverage for general article on the impact of volunteers in the classroom, providing contact information for interested readers.
        - (**Endi**) Help compile a survey to solicit desired information on volunteers.
        - (Ben, Endi, David, Don) Submit survey information to Endi.
            - *Ben's draft dated March 12 was emailed out and has been posted on the workgroup webpage at http://opas.ous.edu///Workgroups2007/Motivate.html#Working_Documents.*
        - *Marcie Benne of OMSI's evaluation team has agreed to help formulate the survey; Ben will liaise.*

- Increasing business involvement outside of the classroom (Eileen, Joyce, Mary Beth, Kathryn);
    - Developed a menu of choices for further involvement beyond National Engineer's Month (NEM):
        - Job shadows
        - Host a class at their work site

        - Mentor student interns via ASE or BEC
        - Mentor a robotics team via ORTOP/SAOF
        - Judge at a science fair via the Northwest Science Expo
        - Teach a class via Saturday Academy
        - Volunteer up to 5 times in 3 months in a STEM classroom via SAOF

    - (**Mary Beth**) Survey 2007 NEM engineers/companies to find out who is willing to participate in further recruitment of individual and especially company participants for NEM 2008 and/or the menu choices above.
        - (**Mary Beth**) For those willing to volunteer for one of the activities above, connect them to the right group.
        - Metric: double the number of companies participating in NEM.
    - (**Mary Beth aided by Di/Endi)** Prepare materials/scripts to help participants recruit for NEM 2008 or through the menu choices above.
    - Add people from these organizations to this subgroup
        - (**Mary Beth**) Hillsboro Chamber of Commerce (e.g. School to Work program)
        - (**Joyce**) Northwest Science Expo:
    - (**Joyce, Kathryn, Mary Beth**) Provide input to Eileen for activity reports to the whole Motivate workgroup.
    - (**Eileen**) Prepare reports to the larger Motivate Workgroup.

- <u>Maintaining connections with NOISE</u> (Network of Informal STEM Educators) (Jo, Ray, Roger, Sue Ann);
    - The group articulated the relationship of OPAS Motivate to NOISE as OPAS influences NOISE, advocating around the "E" in STEM, and represents NOISE interests to OPAS and other relevant spheres of influence.
    - Developed a draft profile format/requirements and a recommendation that NOISE use this to develop an inventory of existing STEM programs in the state of Oregon. We recognize that NOISE includes all aspects of STEM; OPAS would like to make sure that the "E" in STEM gets its full share of recognition.
        - How the program content is tied to state standards
        - What part of STEM is emphasized? Research science? Engineering?
        - How does program delivery map to the Phase Model? Duration of contact?
        - Program type – e.g., after school, summer camp, in-class, field trip
        - Geographical service area
        - Intended Audience
        - Opportunities for connection to industry
        - Funding source/ stability
        - Program connections – OUS? OMSI? Foundation?
        - Metrics: The inventory gets done and published
            - (**Ray**) The concept is presented to NOISE leadership
            - NOISE leadership commits to the idea
            - NOISE finds the resources necessary to do the job
    - (**Ray**) Report back to Motivate on the NOISE leadership meeting March 2 and their reaction to the inventory recommendation.

- (**Jo, Ray, Roger, Sue Ann**) Consider if we want to find a way to extend this inventory to selected national and out of state programs.
- The group developed a diagram and a long-term vision of a program/mechanism to facilitate the propagation of best practices to providers and the delivery of multiple experiences to students, across the phases in the Phase Model, to develop persistence. The concept discussed was the "OPASport" which would allow a tracking mechanism and reward (webgame? Stickers? Points working up to provider discounts?) across multiple providers and experiences and could tie in to Career Pathways work. The group realizes this is a long-term goal and would require more funding and coordination than is presently available.
  - (**Jo**) draw a legible copy of this diagram and post it.
  - (**Jo, Ray, Roger, Sue Ann**) Figure out how to drive toward this long-term goal. Solicit input from the wider group.

- *The workgroup webpage has been updated with an archive of meeting agendas and a working documents section - http://opas.ous.edu///Workgroups2007/Motivate.html.*

Additional Meeting Action Items and follow-up activities:

- **Jo, Ben and Eileen** will meet to review the meeting notes and format, and uncover additional connections and synergies.
- (**Roger**) – Send reference to Jo for posting – American Journal of Evaluation issue on measuring the effectiveness of STEM education
- (**Sue Ann**) – Send reference to Jo for posting – research showing the effectiveness of immersion/ intense exposure model programs.

The **Next Meeting** will be on **Wednesday, April 11 3:30 – 5:00** via phone and at the Capital Center.

Discussion Details

Meeting opened at 8:33

Ben: operative word is draft. Focussed on a few things. Accomplish something this year. Momentum to continue on in to the next year. … as a hiring manager at Intel, most of the people he hired were not born in the US; now many of those people are going home to work. Tap in to the retiring boomers, and bring up the next generation. 1 year: group stronger, momentum, something we can point to that we have accomplished, in a building stage. In 5 years, see more students going into high tech.

Eileen: Intel, Sequent, Tek (…) about software engineering requirements. ETIC. Continuing the work of SAMR. Worried about the workforce, not enough kids taking up engineering, about some of the curriculum as well – need to be the designers, conceptualizers. 1 year – accomplish something, framework for moving forward, metrics, understand what kind of goals we want to set. 5 years – like to see a measurable impact. The metrics have become more of a part of the fabric of Oregon.

Jo: sucked into Bruce's orbit via LEGO Robotics. Long history of work in the schools.

Husband has master's in SW Engineering.

Mary Beth: Making connections, making learning real. Most of the teachers have spent their life in education. Make them understand about their role in preparing students for the workforce. Internships for students and teachers. National Engineers' month – one of our passions, part of why she is so interested in the work of this committee. Getting kids jazzed about science and engineering. See the relevance of math, start to do better. 1 year out – pick a couple of opportunities and do well. More young girls start to think about careers. More minorities, more rural. How do we measure success and how do we know it was our efforts that did it? How do we pick markers? In 5 years – markers stretchable.

Roger: been in Corvallis for 2 years after 27 years at University of Kentucky. Saw sparks of innovation in 4H Corvallis that he wanted to be a part of. 4H as more than livestock and rural. 4H connects to 100 year old land grant university legislation outreach. The knowledge base of the university should benefit kids. Wants to see integration and connection between outreach programs each other and schools. Have begun to see benefits from connections between SMILE and 4H – recently received $80K grant from Harris to do 2 week on-campus STEM camp for URPops. Will be in early August. SEND ROGER LEGO CURRICULUM. Content-rich doesn't necessarily mean that kids are ready to be leaders.

Don: Teach 9-12 at Hilhi; 500-800 hours of adult volunteers in the classroom per year. Lemelson InventTeam inventing a headsup display. Rotary came alive with presentation. Hilhi about 30% Latino, 10% doesn't speak English well enough to cope without help. Kids get experience from a community – each different adult brings a different dynamic to the interaction. After about 13 kids are starved for adult interaction with non-parents.
GET STATS FROM DON on kids in PSU architecture. His question: how to leverage the hours the kids are in the buildings – are we going to have the opportunities for them to take these classes? Addressing the pent-up demand. Auxiliary programs are great, but getting to them while they are in the building – not bussed to Capital Center, the local CC. The Latino kids go home after school to work. Organize things so we can get them applied STEM.

Joyce: my goal is to clone Don. He gets it. We need 1000's of him. The thing about engineering is that it is naturally exciting – it has the cool toys. Humans are natural engineers. Make it possible for kids to invent in their daily lives. 1 year – raise the general level of understanding of engineering in the world at large. Still wants to see a department of ed buyin into OPAS. ODE has twice in a public forum said "oh yeah but everyone wants us to teach their curriculum." And funding. Get legislators and community understanding why they want it.

Bruce: over the last month we have increased our engagement with ODE. Tom Thompson on OPAS, CS Task Force. Mary Bunn. Personal passion raising the next generation to be more aware. Can often learn from talking to the young women why we are not reaching 93% of the young men.

Endi: Keeping tabs, offering their skills. Did Getreal. Masters in Creative Writing. Grew up in a family of educators. Personal motivation – young son, just entering first grade with a real passion for how things work. Really exciting in that OPAS is a state-wide initiative. Deciding how to channel your energies so they really do affect the whole state. The opportunity to effect

more students who would not normally have access to all these programs. Lots of good programs out there but it is pretty spotty which families take advantage. For future meetings, call us in if you think there will be marketing work.

Sue Ann: SMILE program. A group like this is all about leveraging resources and connections. 10 years teaching science in small rural schools. Most students don't even have experience with tools anymore. SMILE in 19th year, 12 school districts, 39(?) schools. 65% of the students in the program are female. 1 in 6 students in Oregon are Hispanic. A lot of what we do is mentoring, opportunities for interaction with adults other than teachers and parents. Do elementary, MS, HS. MS focus is on engineering. Mission to Mars. Near-peer mentoring. 1 year: How can we make this tie into standards and what they are already doing? Teachers are overloaded. We got 6 robotics kits per club, but so many issues on support for computers, having the background to do the kits. 5 years: sustainability, how do you keep it going? Background, IT people issues.

Don: huge part of what we do in SuperQuest is helping teacher get over the hurdles and fear factors.
Eileen: Thank you everybody. Goal: Increase students' interest and knowledge of engineering and applied science opportunities for the purpose of pursuing technology-oriented careers. Strategy: Increase the engineering and applied science content of STEM education programs. What can we do to help the teachers? How to we reach the students? Other adult influencers? How do we increase the involvement of industry? All those aspects, not just what is taught in class.

Ben: Really want some open discussion – if you have comments on strategy or goal. Are there other strategies would complement this strategy of increasing STEM content? Talk it through, work down to the details.

Ben: The Phase Model handout. Ben asked his daughter what made her interested in engineering? Her interest in science and wanted to have a career. She works on firmware for defibrillators for St Jude Medical.

- Awareness – what is an engineering job? How does it differ from science?
- Encounter – does the classroom teacher count? Depends on whether the teacher is primarily teaching or a practitioner who loves to teach.
- Engagement - Can be formal or informal. Some of the barriers to providing this in the classroom, might be easier to use informals sometimes.
- Commitment – not let the first calculus class discourage you.

Identify holes. The last thing he wants to do is just invent a new program. The matrix of existing programs against the phases. This framework might help identify some of those holes.

Roger: really likes the phase model. Particularly for the first generation to go to college – we get them really excited, but do we give them tools to get them on the pathway to go to college. When they go home, how do they know to find the support to know about taking tests, filling out applications.

Jo: Barrier – school capacity (Nikki Jo)

Don: Barrier – the allure of the short-term gratification of having a car. So they take early release or late start and get a job.

Don: Teachers feel they are the plankton of the earth – everybody feeds off them. Don't show up to teachers and administrators and tell them you need them to do more – show up and say you are going to bring them resources. Problems with contracts.

Eileen: Segue to Straw Proposal.

Ben: As a volunteer, figuring out what you take for granted, and how to transfer that to kids. This is more complicated than SMART. Getting the boomers confident and excited.

Jo: loss of art, arts and crafts.
Sue Ann: SMART works because it ties to the standards. Show how it integrates to things they are accountable for.

Don: Intel Ambassador program. He developed 5 lessons. Needed a teacher volunteer training process. Gotta make sure that the support is there for those volunteers.

Jo: Schoelkopf's ODE/PTE factsheet. GET TO DON.

Roger: Wildlife Stewards – they have a volunteer training process to teach the volunteer to work with groups of 3-4 students. This program ties into standards. The program works across 63 schools. Opportunities for more global training model.

Mary Beth: how do you give the "event" like visit from National Engineer's month be sustained.

Joyce: funding to hire a person whose job it is to manage the interaction between the teachers and the volunteers. Have to systematize. Very complicated logistical problem – volunteer called out of the country, what if the volunteer is 15 minutes late.

Eileen: accessing the volunteer force within small to medium businesses..

Mary Beth: Education Champions – Oregon Business Council, E3, The Chalkboard Project, BEC, and SMART (GET MORE DETAIL) understand what the issue was with getting volunteers to work with schools how to encourage that interaction. Focus group yesterday – waiting to get feedback.

Eileen: may be industry specific. Different industries work differently.

Mary Beth: technology spans all industries.

Joyce: maybe one of the projects could be doing an inventory of the industries and how they could tap volunteers – semiconductor people work 3's and 4's; Petroleum has every other Friday off.

Mary Beth: passed out the BEC NEM manuals (Positive feedback)

Roger: training may differ geographically. Some need content and pedagogy, some might only need pedagogy.

Eileen: How do we collaborate with NOISE.

Endi: What about tapping into the after-school aftercare?

Roger: a bleedover effect – some of the kids find out their teachers are really cool.

Joyce: What's missing – the motivate part. We have ideas on how to connect, how do we change the soul of the child so they are excited about it? What specific ideas do we have that will so entice the child that he/she can't let go?

Eileen: Give people enough exposure, because you can't be sure you will capture the teachable moment. Can't define that one thing will trigger them.

Roger: Design issues: do they feel like they belong? Developmentally appropriate?

- Do it in a group
- Feel connected
- Experience success
- An opportunity to give
- Independence and opportunity to make decisions
- Ongoing relationships with adults

Don: Let me suggest the Robotics program. Lotta buyin. Kids have predisposition that this is going to be fun. SuperQuest.

Sue Ann: How do you bring girls in?

Joyce: Engineer an activity that will be attractive to young girls, maybe piggybacking on Robotics.

Eileen: What engineering disciplines attract more girls and center on those, figure out why?

Jo: Using the tool to do something, not just glorying in the tools themselves.

Joyce: Mothers invent all the time, but its not seen because it doesn't become commercial.

Don: really need to test stuff on kids. He is constantly surprised.

Kathryn: making a storyline (FLL stories change with yearly theme).

Ben: stop, summarize, intro David and Kathryn.

David: MESA Spiel. 1 year – would like to see tangible, specific items coming out. And a strategic plan for 5 years. Work within own programs as well as effect outcomes elsewhere. 5 years – effect changes in Science benchmarks, and include technology, and funding to back it.

Kathryn: SAO – fairly standard trade association, 500+ companies. Budget has tripled in the last two years. Serious about K12 education. SuperQuest is technology education for teachers. 2-5 day workshops in the summer and 1 day workshops to keep teachers connected during the year. For every teacher we reach, we reach 10 – 100 students, but we are interested in direct delivery as well. 1 year – something tangible, we had a role in that. 5 years – ideally, we wouldn't be necessary.

BREAK 10:40 – lots and lots of conversations going on. Joyce will take BEC manuals to Susan Shugarman and see if she has comparable materials to share. Get it to BEC also if something comes back.

Ben and Eileen want to meet and go over the minutes.

Ben: what I heard from the discussion is a lot of elaboration of the straw proposal. I'll take that as an endorsement. Does the strategy reflect what you want to be doing? Are the areas right? Go over the worksheet, specific action items. Almost too many great ideas, need to prioritize, can keep some on the back burner. Metrics are also important to keep in mind.

Missing?

- Joyce – the real binder here is keeping the excitement. Make sure we don't forget about that. (Saturday Academy – we give kids a reason to learn algebra.)
- Ben – internal motivation is the only one with staying power

Areas ratified.
Split into 3 subgroups

- Volunteers/ In-classroom: Don, Ben, David, Endi
- Businesses/ Outside Classroom: Eileen, Joyce, mary beth, Kathryn
- NOISE: Jo, Ray, Roger, Sue Ann

Next Meeting: Second Wednesday, April 11, 2007 3:30 – 5:00 Capital Center and by phone

Ben's report out: Increasing volunteers in the classroom:

- First: increasing the number of volunteer hours in the classroom.
    - Survey existing volunteers who spent more than 100 hours in the past year
    - Get better idea of who to target
    - Events on which we can dovetail such as ORTOP, talk to a captive audience, find those interested in doing more

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Notes from 3-1 Motivate Breakout Group 1: Increase the presence of in-class volunteers (Ben)

Agreed the goal was initially to increase the number for adults volunteering time in the classroom, as opposed to focusing on improving the effectiveness of the volunteers

Brainstorm list of possible actions:

1) Survey existing volunteers to formulate a list of volunteer attributes to:
   - Help target the most likely types of folks to focus recruiting volunteer (e.g. parents of students, outside the home employed or not-employed)
   - Structure/organize volunteers to insure they have a good experience in hopes they will continue volunteering
   - What are some pitfalls to avoid?
   - Consider surveying Intel folks who volunteer over 100 hours

2) Investigate how to expand volunteers to rural schools and other locations where large high tech industry employers are not present.
   - Chamber of Commerce or Rotary Clubs are good places to get connected to small business that might

3) Compile a list of current mentoring programs e.g. Oregon Mentors then determine if this is a good source of volunteers to recruit from

4) Formalize a mentoring program for Engineers, paring a practicing engineer with interested High School Students
   - Would need a training program for the mentors

5) Goal is to increase the classroom volunteer hours
   - Pick up to 3 existing models that work (such as the one Don Domes uses) then scale it to other schools
   - Initially pick schools with existing infrastructure to support volunteers then replicate this infrastructure at schools that have none. Note that H.S. career centers typically also perform volunteer coordination

6) Host an introductory session for interested volunteers
   - Suggest using existing venues such as ORTOP Tournaments, Science Fairs, Smile Challenges, MESA events, where interested adults are already present
   - Tap into BEC existing inside the classroom programs such as National Engineers Week as a source of interested volunteers, who might be receptive to volunteering again.

Action Items:

Ben
1) Investigate surveying Intel volunteers both (current and retired) who log more than 100 hours/year
2) Tap into Intel Retirees as a source of potential classroom volunteers

Endi
1) Check with Di on PR coverage for general article on the impact of volunteers in the classroom, providing contact information for interested readers.
2) Agreed to help compile a survey to solicit desired information on volunteers

All – Submit survey information to Endi

Eileen's Report Out: Increasing business involvement outside the classroom

- Leverage what's already out there, get businesses already out there
- Start with National Engineer's Month followup
  - Recruit for next year
  - Volunteer for additional outside event
    - Menu of connection to groups
      - Job shadows
      - Host a class at their work site
      - Mentor student interns via ASE or BEC
      - Mentor a robotics team via ORTOP/SAOF
      - Judge at a science fair via the Northwest Science Expo
      - Teach a class via Saturday Academy
      - Volunteer up to 5 times in 3 months in a STEM classroom via SAOF
    - Measure all that
      - Hitting awareness and encounter phases
      - Measure increase in NEM participants
        - Goal 60 companies next year
        - # companies who go to next level
        - # recruitment referrals
        - Try for #students touched
        - Add NWSE, Hillsboro Chamber of Commerce, SuperQuest

Subgroup: Increase business involvement outside the classroom (Eileen)- Meeting Notes
March 1, 2007

Subgroup Members: Eileen Boerger, Joyce Creswell, Mary Beth Horton, Kathryn Schwartz

Process

Leverage the National Engineer's Month (NEM) participants from 2007 (individuals and companies) by asking them to:

1. Help recruit next years NEM participants
2. Ask if they are willing to participate in other activities to reach out to students by providing them with a list of possible opportunities for volunteering and asking what they would be willing to participate. The list of possible activities is:
   a. Job shadows
   b. Host a class at their work site
   c. Mentor student interns via ASE or BEC
   d. Mentor a robotics team via ORTOP/SAOF
   e. Judge at a science fair via the Northwest Science Expo

f. Teach a class via Saturday Academy
g. Volunteer up to 5 times in 3 months in a STEM classroom via SAOF

Mary Beth volunteered to include volunteer options in a post-NEM survey that BEC releases in mid-March. These options would be included in the survey version released to engineers. Di and Endi agreed to help with survey formulation.

Metrics

Focus on "awareness" and "encounter" of the Phase Model

- Number of engineers participating in NEM in 2008: goal is to increase over 2007
- Number of companies participating in NEM in 2008: goal is to double the number of companies over 2007 (60 companies in 2008).
- Number of engineers and companies that participate at the next level, i.e., participate in one of the activities above.
- Number of referrals generated by this years NEM participants.
- Number of students participating in these activities.

Task Assignments

1. Survey 2007 NEM engineers/companies to find out who is willing to participate in the activities listed in #1 and #2 under Process.
   Action assigned to: Mary Beth Horton
2. For those willing to volunteer for one of the activities above, connect them to the right group.
   Action assigned to: Mary Beth Horton to connect to the right group.
3. Prepare materials/scripts to help participants ask others to participate in the activities listed in #1 and #2 under process.
   Action assigned to: Mary Beth Horton (with help of Di Saunders)
4. Add the following people to this subgroup
   a. Someone from the Hillsboro Chamber of Commerce: **Mary Beth will pursue this.**
   b. Someone from the Northwest Science Expo: **Joyce will pursue this.**
5. Prepare reports to the larger Motivate Workgroup.
   Action assigned to: Eileen Boerger (with all subgroup members input)

Roger/Jo Report-Out: How to collaborate with NOISE around the E in STEM.
The big diagram. Jo to recopy for posting. For more detailed notes, see Summary above.