



OPAS Motivate Workgroup

Worksession Record

#14 – June 5, 2008

Attendees: Ben Manny (Intel Retirees), Jay Well (SMILE/ OSU), Mary Beth Horton (BEC), Ryan Collay (SMILE/ OSU), Ray Vandiver (OMSI), Endi Hartigan (OUS), Don Domes (HilHi), Terrel Smith (Sherwood), David Coronado (MESA), Jill Tucker (Lemelson), Jo Oshiro (OPAS/ OUS)

Meeting Objective	<i>Define the key components of an Engineering Challenge Pilot proposal</i>
4:00 - 4:05	Meet and greet
4:05 - 4:55	<p>Key goals/learnings of the Pilot proposal</p> <ul style="list-style-type: none"> • Does an Engineering Challenge program, based key components of after school athletic programs, work? <ul style="list-style-type: none"> ○ Will school districts pick up the full cost after seed funding runs out? ○ Will head engineering coaches be sufficiently motivated to become champions for Engineering Programs at local schools? ○ Is there a sufficient pool of interested and qualified candidates to become engineering coaches? ○ Program attracts sufficient student interest ○ Does the program provide a follow-on to FLL teams? ○ Students are able to commit the time needed to fully participate in an engineering challenge ○ Do participating students receive more scholarship dollars? • Can the pilot program be scaled to a full seed program? • Are there major differences in how the program is run for different Urban/Rural, Large/Small, Public/Private schools? • What is the cost of the full seed program? • What is a good cost split model between seed funds and school district funds? • What is the time commitment for coaches/students/parents/administration? • When is the best time to run challenges? Fall/Winter/Spring/Summer? • How long should a "challenge season" last? • How should the ETIC seed program be administered? <ul style="list-style-type: none"> ○ Existing organization e.g. Tech Start Foundation, or OPAS? ○ New Administrative • How much coach training is required? • Will outside school time program motivate non-school based teams? (This happens with athletics, e.g. swim teams, soccer) • How should the challenges be administered, by current organizations, or should schools (or Universities) assume this responsibility? (What does the athletic model suggest?) • Learn more about the available Engineering Challenges to determine if the seed program should focus on a limited set? <ul style="list-style-type: none"> ○ FIRSTTech Challenge (FTC) ○ OGPC (Oregon Game Project Challenge?) ○ InvenTeams ○ IEEE's Design Challenge ○ JETS ○ FIRST Robotic Challenge (FRC)

4:55-5:20	<p>Selecting the Pilot Schools</p> <ul style="list-style-type: none"> • What are the key drivers of the selection process? <ul style="list-style-type: none"> ○ Pick a cost target, then include up to that many schools? ○ Base selection on key learnings (Urban/rural/small/large/private/public) ○ Model if after what we want to use for the full seed program • Mechanics of selection process <ul style="list-style-type: none"> ○ We target specific schools ○ Ask schools to submit proposals ○ Ask a set of schools to submit proposals • How should the costs be split between school & seed funding for Pilot? • What the requirements a school must meet to qualify for pilot program • How closely should we tie the pilot to schools with current PLTW programs?
5:20 - 5:50	<p>Coaches</p> <ul style="list-style-type: none"> • Who sets the stipends? (Principal, mandated by the pilot program, guidelines, e.g. competitive with athletic stipends) <ul style="list-style-type: none"> ○ Does anyone already get paid? ○ What does athletics spend? ○ What is the FFA, Band, Annual, Speech Team, etc. models and how much are those stipends? ○ Who gets paid in athletics? ○ How do assistant coaches work? ○ What is an Athletic Director? How much time during school is assigned to their function? ○ What is OSAA and what is the budget for it? <ul style="list-style-type: none"> ▪ http://www.osaa.org/osaainfo/ ○ What do schools spend for the athletic program? <ul style="list-style-type: none"> ▪ Are additional costs covered by families, boosters, fundraising? • How are engineering coaches selected? School administrations may not know what to look for. <ul style="list-style-type: none"> ○ What are the qualifications? ○ What training is needed? Who provides it? • Does Pilot include Head coaches and assistant coaches at same school?
5:50 - 6:05	Dinner service
6:05 - 6:30	<p>Students & Parents</p> <ul style="list-style-type: none"> • How are students recruited, motivated to participate? • Gaining parent support <ul style="list-style-type: none"> ○ Encouraging their student ○ Financial support for transportation and out of town competition fees ○ How do you organize a parent support group? • Should pilot program contain an "Engineering Letter" for the student?

6:30 - 7:00	<p>Challenges</p> <ul style="list-style-type: none"> • Head-to-head team competition (Robot wars) vs. engineering/design component (InvenTeam, JETS) vs. Scored Performance (FLL) • Any changes needed to Support Challenge Program • What are the competitions available? • How much time does it take to prepare for a competition? • How much does it cost to enter a competition? • What is the state of those entering competitions now? • How do the teams get to be part of the all school sports assemblies that are held several times a year to recognize students on sports teams?
7:00 - 7:30	<p>Metrics to Collect</p> <ul style="list-style-type: none"> • Contact hours • Testimonies (Coaches, Parents, Students, Principal ...) • What is the actual costs per student contact hour, or is there a better cost metric? • Will schools agree to sustain the program? • Where will the sustainable dollars come from? • Impacts to other Out-of-School-Time programs? What existing OST programs give up time to add engineering competitions? • University scholarship dollars - especially for students receiving a letter in engineering • Will engineering colleges "scout" for students at the competitions?
7:30 - 7:55	<p>Administration & Logistics</p> <ul style="list-style-type: none"> • Funding sources for Pilot (Challenge Programs, Foundations, Universities, School Districts themselves) • When should we target the Pilot? • Time line for completing Pilot proposal/getting funding/selecting schools/holding competitions • How many years should the Pilot run? • Should student scholarships be offered directly - or through the engineering challenges
7:55 - 8:00	<p>Next Meeting - Wednesday, July 9, 3:30 - 5:00? Items for the Agenda?</p>

Summary as emailed and posted July 3, 2008

Eight members of the workgroup attending the June 5 worksession, hosting guests Jay Well of the OSU SMILE program; Terrel Smith of Sherwood High School; Jill Tucker from the OPAS Succeed Workgroup and the Lemelson Foundation. A wide-ranging discussion of the Engineering Team Challenge Pilot Program as an element of the OPAS “Bright Future” proposal to ETIC converged on these key points:

- A “club” format is preferable to a “team” format:
 - Clubs are more inclusive and can provide a safe place with a group of like-minded kids who like school, math, science. Club activities may include fielding one or more teams to one or more kinds of competitions and exhibitions, and can provide a context outside of a competition season, follow-on activities, and fitting activities to current student interests and local resources.

- Engineering-based service activities or programs such as “Design For the Other 90%” could be key to recruiting women, ethnic minorities and potential first-generation-to-college students.
- OPAS wants to support activities that focus on its goals, that leverage existing programs and infrastructures. We want clubs of future engineers rather than future research scientists.
- **Core mission: increasing interest in ongoing engineering education.**
- Club “coaches”:
 - Are local champions/evangelists.
 - Need an assistant for increased flexibility, and support.
 - Are a focus point for sponsors and volunteers.
 - Need mentors and funding.
 - Extra pay for extra work is good.
 - Need connections to high quality curriculum and activities, ways to connect that back to classroom curriculum and standards, a common methodology around delivering content.
- A central support organization is necessary:
 - Coaches should not have to invent infrastructure.
 - Summer workshop:
 - Share curriculum – plenty of good stuff out there.
 - Develop and share methodology for delivering content and practicing skills to best engage students – early adopters can help develop these.
 - (Ryan) Oregon State might be interested in housing the central support organization and running its workshop.
 - (Ben) Techstart could be a logical home of administration; STEM OST could be a separate thread inside SuperQuest. Don and Terrel concur.
 - Early adopter champions (Don Domes, Terrel Smith) can each mentor another school.
- Selection and evaluation:
 - At least one of the pilot schools must be rural.
 - We must look at evaluation from the beginning.
 - David Coronado of MESA and Ryan Colloy of SMILE may have a key set of 5 metrics to suggest.
- Costs:
 - Terrel: I think I could find at SuperQuest 6-8 schools that would be interested in trying this model, but at an estimated \$20K apiece, that’s \$200K. If that money is not a reality, it is hard to put the program out there.
 - 2 teachers extra-duty contract:
 - Year 1: 50% school district match; OPAS may need to cover equipment
 - Year 2: 50% school district match
 - Year 3: 75% school district match
 - (3 year horizon is important, as teacher contracts are for 3 years).
 - Ryan will provide better explicated cost figures.
- Necessary and Sufficient Conditions:
 - Terrel: It takes a champion in the school. Principals and superintendents are way too busy, we’ve tried it for years. Buy a day for teachers to come understand your dream, and then you launch them. I can host a 2 hour workshop for SuperQuest teachers on how to do this. Some might do it without the funding in place. Terrel, as the Union

representative, has written this idea into the contract currently being negotiated with Sherwood, and recruited John Niebergall to act as the coach/advisor should the stipend survive the negotiation process.

- Ben: the pilot portion of this program could be identifying that first group of champions.
 - One resource might be OMSI's new OMSI Ambassador program, which is attempting to identify an OMSI champion at each school to serve as a communications conduit.

Next Meeting: Wednesday, July 9 4:00 – 5:00 (*subsequently rescheduled to July 16, 3:30 – 5:00*)

Action Items as emailed and Posted July 3, 2008

Ryan:

- Document some key differences between a club and a team (*Jo got rough draft June 24*)
- List of 5 metrics to Jo (*requested July 3*)
- Pencil-out of costs to Jo (*requested July 3*)

Terrel:

- Work up some concrete pilot program numbers with Don, Ben, Ryan. How much would we need to raise?
 - Pilot scoped as 3 year program; District pays 50, 50, 75 and then 100% of stipends.
 - Initial startup budget: teacher's workshop, release time, travel time, subs, materials and startup (much of it not consumables); District picks up consumables budget. Ideally, teaching materials in all the engineering modalities. What about schools that are equipment-rich?
 - Recruit and train pilot at Superquest with Don's help, even if all we can communicate is the model.
- Ben & Don: talk to Chris Brooks of SuperQuest, make sure that he has bought in to this model.

Jo:

- Get Don, Ben, and Terrel the document by Don Kirkwood on his recruiting activities. (*done July 3*).

Elaboration: Items Discussed and Referenced

Structuring the coach's pay:

- Terrel Smith, Sherwood High School: I am the track and field coach, union rep and one of the technology teachers at Sherwood.. I did a dry run on this idea (as explained by Don Domes). [*Extra-duty point and stipend schedules were distributed at the meeting*]. Sherwood might pilot it. Rough figures, based on the track season: 10 weeks, 200 hours (low estimate for head coach). Leadership position – managing volunteers. Must be some leverage. These will be talking points during negotiations, extra pay for extra work is attractive. Problem may be finding the right person. Common in all district to have trouble finding the coach, especially as in many sports there is an expectation for year-round programs John Niebergall at Sherwood may be interested in the position.
- Ryan: SMILE stipends start at \$1600 year for 30 1 hour meetings plus 3 off-site professional development sessions with PDU credit. Ryan thinks that the total package is similar in value – about \$4500, but not all delivered in cash and not structured as an extra-duty contract.

Club vs. Team; competition vs. adjudication/participation/exhibition:

- Terrell estimates 15-20% of his track students would be happy to NEVER have a track meet.
- Ryan: One of the most important things the SMILE clubs provide is a safe place with a group of like-minded kids who like school, like math, like science – the MS challenge is not the biggest carrot. Does the club setting come first? Does the activity come first and then back-fit the club setting. The clubs are not a team. SMILE and MESA connect in a different direction – an enrichment model – make the other 25 hours in the classroom better – apply what they are doing in class in a contextual way, and that culminates in some sort of event/exhibit/culminating event with large creative element – all links back to school enrichment, persistence, attendance. Programmatic pipeline – link back to curriculum, the aha moment, college-going culture. One SMILE club leader's [ORTOP FLL] team was white middleclass boys; his SMILE club was Latino girls. One year, SMILE funded LEGO robotics for all the middle schools, who thought it was great –but the SMILE kids were not interested for a second year.
- David: My preferred metric is changes in attitudes toward math, science, and education in general.

Structuring the Pilot:

- Mary Beth: Different kids relate to different models. Options would be good.
- Jay, Ryan, Ben: more closely define the students you want to recruit – future engineers rather than future research scientists.
- Endi: Easier to get funding for more flexible, less prescriptive programs that districts can use as they like.
- Terrel: Near-peer mentoring works: Sherwood HS school students teaching elementary students. At elementary level, include everybody – become more focused as progress up the grade levels.
- Mary Beth: Define a time frame to show results from the pilot.
- Ben/Jill/Ryan: shy away from Robot War model. InvenTeam is a no competition model; however, it is not really replicable without a lot of money. WGBH Engineer your Life, a website for girls is based on market research -- service is really important. Club format might be more replicable and conducive to a service element, perhaps even having high school students defining a local problem and solution ala Design for the Other 90%.
- Terrel: We are in the design phase – I'll take back these ideas to John Niebergall, looking at this like a technology missionary – cast the widest possible net. Gaming, robotics, and what else? If it's sustainable, I have to have my administration have a good reason to fund it – seeing those kids jumping up and down. I have to be able to sell it – enrichment, extension of your academics. A club is a great way to start.
- Ben: where do you start? Top-down from school districts? Find the teacher champion?
- Terrel: Principals and superintendents are way too busy, we've tried it for years. **It takes a champion in the school.** Buy a day for them to come to understand your dream, and then you launch them.
- Jill: another source of funding – Youth Venture Part of Ashoka Foundation in Washington, students apply -- \$1,000 and some really good training – improve the world problems. International component, about 9 years old -- <http://www.genv.net/>
- Ben: Let me summarize: an engineering challenge model has many good aspects but reinforces the top of the engineering spectrum. Maybe another way to start this is to focus on these clubs that could appeal to a wider audience that could then field these various teams. Change attitudes so students think about going to college. Model of a tech service coach has a lot of appeal. Issues: finding how many existing potential coaches are out there that we could

approach, to tap that what you would probably want to do, organize a similar summer training session focused on these OST activities, for more rookie coaches encourage participation in one of these national challenge/competitions, more experienced coaches could design their own.

- Ryan: there is slippage between finding the early adopters and making it more generalizable – a program needs more support than just a stipend, it needs connections to high quality curriculum, greater support system. Organizing workshop to get at core concepts. Common methodology around delivering the content; early adopters to help define. Well-defined core mission – increasing interest in ongoing engineering education. Common mission, common methodology, large collection of curriculum to choose from. We are hurting for methodology and champions. “I really hate teachers working for free in the summer.” Ballparks the costs at about \$17K per school per year
- Ben: 2 people should be a minimum at a school. Avoid inventing challenges, avoid inventing curriculum. Coach should not have to invent infrastructure.
- Ryan: the problem is there is no lack of activity books (not really curriculum) but what is lacking is how to link that activity book to current classroom curriculum and standards but also to real-world context. Keep a high expectation centered on the mission, goal, method and set of materials. Not try to cookie-cutter the program -- how they exactly meet that mission/goal needs to be flexible.
- Don: What would be really awesome is a math teacher, a science teacher, and an engineering teacher. Fears the communication gap
- Ben: pilot takes the 4-5 champions (Don, Terrel, ...) and each picks another school to mentor directly the two people at that school., help with right buttons to push, matching fund here. An Amway model, and there would be an Amway – a central organizing model.
- Ryan: It can't be us, but we can contribute to. I think Oregon State would be interested in housing it, running the workshop.
- Ryan: proving that any intervention has raised grade is really hard. We must define our own goals and metrics and think about.
- Ryan: Really look at summer 2010. Include release time for teachers to come and visit other schools. Travel and some release time/sub costs.
- Don: ask for 2 meetings a week, over 30 weeks effectively.
- Terrel: the 2 obstacles are funding and district administration. The metrics and administration come from some brainstorming. District administration barrier is that their plate is so full and have so many other asks. Getting their time, attention, and money will be difficult.
- MBH: I think Corporate partners would be interested as well – developing their future workforce. Synopsis, Tektronix, Intel, Xerox, Vernier – the usual. Just have to find the champions within the companies. Funding mostly but also idea people.