Present:
Neal Armstrong  Tamara Walser  Alvin Kwiram
Mike Bruck  Bruce Robinson  Dana Riley Black
Laura Collins  Natia Frank  Jasmine Bryant

1. Introduction to the Office of Educational Assessment
   DRB introduced (again) Tamara and Laura.

2. Definition of formative evaluation by OEA
   LC – Formative evaluation is not the end-of-course, scanned surveys. It is done at
   the beginning of a program and aides in the development of the program.
   Summative evaluation is performed at the end and is what is reported out.
   Formative evaluation provides baseline data, information regarding the needs of
   the audience, and provides direction.

3. Description of opportunities for formative evaluation at the PRF Workshop and before
   end of NSF fiscal year
   • DRB – Opportunities to do formative evaluation at the workshop: Friday
     afternoon (web modules) and Saturday afternoon (with various populations). The
     populations we have brainstormed around include:
       ▪ Graduate students and undergrads from 4 year and 2 year colleges
       ▪ Faculty and post-docs from 4 year and 2 year colleges
       ▪ K-12 teachers
       ▪ Business/industry
       ▪ ANLO
   • NA – Which populations can we poll at workshop/SAB meeting?
   • JB – For workshop, most populations (not many people from business/industry or
     K-12).
   • AK – SAB time is scarce, maybe Sunday afternoon. Members who are not part of
     the SAB sub-committees along with affiliates may be available.
   • AK – The focus of the STC is esoteric…How likely is it that we can feed opto-
     electronic materials to K-12 audience?
   • DRB – Content can be emphasized less than career pathways at this level and the
     STC can provide support systems to help teachers assist their students in entering
     the career pathway. Also, the STC is committed to educating about the ethics and
     practices/procedures of science.
   • NA – We can provide material for teachers and the tools to support it.
   • AK – Is it realistic to say “We’re from higher education, we’re here to help?”
   • DRB – This leads to the types of questions we want to ask during formative
     evaluation…there are 4 categories (so far):
       ▪ Career pathways for more and more diverse learners
       ▪ Knowledge/skills around content – teaching & learning
       ▪ Knowledge/skill around ethics and procedures – teaching & learning
       ▪ Web modules are interwoven through all
- DRB – Stipend + food = high school teachers…we can get teachers in at a later time – it doesn’t have to be during the workshop.

Retreat:
Tentative plans for end of summer. We can look at the data gathered and other data that is out there. Coupled with the interest areas of STC members we can pull together a cohesive education plan.

- NA – Are there industry folks committed to an educated workforce? They could provide additional perspective in an afternoon.
- DRB – Perhaps the Tech Alliance? Brian Chee is the Director of Ed.
- NA – Could we have a sub-section of the SAB involved in a discussion?
- AK – There is an education sub-committee. We may be able to involve them.

4. Input from team regarding items to include in formative evaluation.
Arizona crew: send formative evaluation items to JB and she will coordinate with OEA.
What are your topics for discussion for Friday afternoon and what are your questions?

- AK – Think on what it means to develop baseline data on web modules.
- NA – Coupled to “What do we really want to do with web modules?” – more than a place to interact. Users must do things (on bench or screen). What do we want them to know, do and HOW?
- DRB – Pedagogy around “how” is important. The “what” comes later.
- NA – Students must do something: interact, change the index of refraction, color of beam, etc. and at each level. There has been no assessment with other web module programs: no pre-test, no post-test.
- NF – We can break this down into 3 areas: Accessibility/Methodology, Pedagogy, Content.
- TW - There has been research done around web education: the review by Shelley Balanko at OEA, professional journals on web-based technology.
- DRB – We need to think through the pedagogy and we all need to think through it together.
- NA – At the workshop, we should give people an idea of our initial vision, what we have so far, and where it is going and see how they react to this. Mike and Jenny have assembled a document at: www.stc.arizona.edu. They have broken down the development effort into blocks and have lists of links to science ed sites. We can say to NSF we are aware of other sites.
- For web modules content: scope and sequence.
- We should involve STC grad students as a focus group.

5. Update on educational plans
- There will not be an education team meeting on Sunday, June 22 – Strategic Advisory Board Meeting (management team needs to attend).
- Next education team meeting plans.
  Date and time: Tuesday, June 10 at 1pm.
  Planning for site visit and SAB meeting.
Begin educational retreat planning (for end of Aug./Sept.)

8. PRF workshop planning
   • Laboratory experiences
     Lumera trip has pros and cons – off-campus, chance to see manufacturing, chance to see industry setting.
     Other lab ideas: waveguide coupling (Alex Jen, Ann Mescher), scripted demonstrations, SCM demo/activity (Xia), How to make an organic LED, software packages for designing lenses (provides participants with tools), visit web sites that teach optics and have participants evaluate (Florida State, Georgia State – Hyperphysics), Mike will send recommendations.

   • Tutorial session plans
     Natia and Jasmine are working on this.