

LTER-Based Professional Development for K-12 teachers: opportunities for collaboration

September 12, 2012

Co-Organizers: Kari O'Connell, Alan Berkowitz

Attendees: 33 attendees from 22 LTER sites and one international LTER site.

Goal: Almost, if not all, of the LTER sites have professional development of teachers as part of their K-12 education programs. This working group set up the participants to plan cross-site professional development (PD) collaborations that draw on unique strengths of the LTER network and provide next steps for the LTER SIP.

Agenda

1. Introduction by Kari O'Connell & Alan Berkowitz
 - a. LTER Education
 - b. Next Generation Science Standards
2. Lessons learned from existing cross-site projects
 - a. Education research
 - b. Workshops
 - c. Research Experiences for Teachers (RET) and Teachers in Residence (TIR)
 - d. Others
3. Brainstorming
4. Group break outs around key ideas for collaboration
5. Small group report outs
6. Wrap up and action items

Ideas from brainstorming:

- Need to consider Pre-Service teachers - directing efforts at education majors, students before they're teachers.
- RET exchange.
- Getting RET teachers together from different sites virtually. Could become a more powerful experience - encourages the teachers to understand their program to such a level that they are able to communicate their project to their peers.
- Professional Development for Professional Development leaders (at LTER sites).
- RET teachers/teacher leaders helping with library of educational resources.
- Working cross-site encourages accountability of resources and products produced by individual LTER sites' programs.
- Teacher leaders contribute to ecology education on a national basis - expand our thinking and focus by working with other sites.
- Think creatively about encouraging teachers to become active in research and develop interest in potentially becoming a RET.

- Consider including arts and humanities in teacher programs - interdisciplinary collaborations can be very powerful - e.g. Having art teachers doing an accurate species profile followed by a drawing of that species.
- Socioecological collaborations - with social science teachers.
- How is your site important to the local economy? Consider cross-curriculum activities.
- Make other site's information and experiences valuable to other sites - exposing teachers to other sites.
- Expose teachers to the uniqueness of other sites, but not ignoring the importance of your site to your region.
- Consider a modified REU program for teachers. Could be RET teachers who already understand their area.
- LTEAR - long term education action research.
- RET - in scientific research - NSF version
- RET - in educational research - MSP version

After the brainstorming session, we condensed key ideas into the following topics to be discussed in small groups:

1. Cross-site RET program (Ali Whitmer reporting)
2. Pre-service teacher experiences (Jill Haukos reporting)
2. STEAM – STEM with arts & humanities (Jan Dawes reporting)
4. PD for PD Leaders (Monica Elser reporting)
5. RET virtual exchange/teacher data jam (Beth Simmons reporting)

Below are brief notes from each small-group discussion. Each group was asked to come up with one or two small, doable action items, and these were identified as our wrap-up for the entire working group. Leaders start work on the next step – hand off or say no.

More detailed notes from the individual discussions are at the end of this document.

1. Cross-site RET program

- Rotating to different LTER site each year over 3-5 years, but RETs from many different sites could be involved (not just RETs from host sites).
- Ecological themes that teachers would work on
- Include local teachers and undergrads
- Host sites would need to have staff support, facilities, and researcher support
- School-year follow-up
- Application process
- RET conference
- Teacher leader development

Action items: 1) Ali will send an email to group to see which site(s) would like to be a host site, and 2) Ali will meet with NSF folks about the cross-site RET idea.

2. Pre-service teacher experiences

- How to break the barriers for educators?
- Open houses for current teachers and education minors
- Internships
- Recruit for Teachers Workshop
- Recruit RET and REU from teachers workshop

Action item: break those barriers. Two Open Houses – hit existing teachers, pre-service teachers. For example, a free Bison loop with food. Internship for environmental educators. Then RET. REU.

3. STEAM (STEM with arts & humanities)

- Define what we think STEM should be.
- What is the current situation?
- Recognize and underscore the importance of building core teacher teams.

Action items: survey the LTERs that are already doing interdisciplinary PD. How did they start? Best practices? Of what sites are doing?

4. PD for PD leaders

- Invite someone to do best practices/PD if we get together as a group of LTER education representatives the summer of 2013.
- Have a common calendar of PD events on the LTER web site so we can see when other LTER sites are doing PD and possibly join in.
- Ask each site PI for a small amount - \$750 or so to support professional development for LTER education representative.

Action items: Invite someone to do best practices/PD if we get together as a group of LTER education representatives the summer of 2013.

5. RET exchange /Teacher data jam

- Virtual teacher exchange
- Invite “LTER junkies” (meaning the teachers who have done a lot of work with our LTER sites – RETs or otherwise.
- Allow for small groups of these teachers to do virtual workshops
- Could do a summer RET - meet and share experiences with other RET teachers, meet again in the winter or spring
- Set up a platform to make it easy for active teachers to interact and share experiences

Action items: Try virtual RET exchange with a small group. Twice –research experience sharing and sharing after implementation. Set up the platform.

More detailed notes of the small-group discussions (if they are available) are below.

Cross-Site RET Discussion

Participants included: Ali Whitmer (leader), Mark Schulze, Chad Johnson, Andy Brooks, Robert from PIE, Steven McGee, Molly Charnes, Jason Love, Mary Spivey, Kim Mellon, Saleit Ron, Nick Oehm, Carol Blanchette, Kari O'Connell

Cognitive dissonance. Are you understanding at a deeper level in studying concepts across site?

Rotating among sites for logistic reasons but might not be the best for finding scientists/mentors.

As a way to get at a theme or concept.

Same teachers or different teachers over the years of the project?

Teachers apply (with recommendation from site). Use three/four sites as rotating host site, but teachers from any site can apply.

2 teachers from 1 site apply together.

Virtual follow up

2 teachers who participated can lead workshop back at site.

4 to 6 weeks. Or less. These teachers already have experience.

Could create connections among scientists among sites.

Teacher leaders at host site.

RET conference – piggybacking on ESA or NSTA.

Next steps:

Ali talk to folks at BIO, EHR

Identify who would/could host

Identify themes

RET virtual exchange/data jam

Participants included: Beth Simmons (leader), Stephanie Bestlemeyer, Geoff Wilson, Robert Bohanon, Noelia Baez Rodriguez

Interdisciplinary PD: STEM* to STEAM*

*STEM (Science, Technology, Engineering, Math)

**STEAM (STEM + Social Sciences + Art)

Participants included: Alan Berkowitz, Janice Dawe, Art Schwarzschild, Elena Sparrow

Action steps:

1. Define what we think STEM should be.

Our concept of STEM is interdisciplinary. It links to place and includes both social sciences and art. Interdisciplinary PD could be called STEAM or S-STEAM (Science (including both Natural and Social Sciences), Technology, Engineering, Arts, Math).

2. What is the current situation?

One of our first action steps is to survey the LTERs that are already doing interdisciplinary PD, and ask:

- How did you get started?
- What best practices have you developed?

Once we have a picture of interdisciplinary PD within sites, we can share between sites and look for the commonalities that could build cross-site collaborations.

Note: During this discussion, we wanted to jump to considering specific thematic approaches, but felt this aspect of STEAM would come forth from the best practices survey. Our discussion of this did, however, lead to a consensus point:

The strength of interdisciplinary PD or STEAM lies in its ability to work with real-world issues and use current issues in developing interdisciplinary materials that develop problem-solving skills.

3. Recognize and underscore the importance of building core teacher teams.

Our experience has shown that teachers who want to be involved in interdisciplinary professional development step forward as partners on their own, one or two teachers at a time. Their interests and background often coincide with questions their LTER is addressing. In this way, interdisciplinary teams build naturally, and buy-in to the interdisciplinary approach is achieved from the start. This means it is not necessary to use a more shotgun approach, or try to convince every teacher to become part of interdisciplinary PD.

(notes compiled by Jan Dawe, jcdawe@alaska.edu)