

**Session Title:** Concurrent Session 1A – Connections to Formal Education

**Moderator:** Pat Hamilton

**Note taker:** Lexie Brown

**General Notes:**

- Luann Dahlman: Night Lights dataset has accompanying module (grades 5-8) by NASA
- Peter Leighton: Programs initiated by museum (funded by grant money)
  - Sixth grade school district focus on watersheds – museum did sphere presentation about watersheds
    - Included ½ hour with sphere, water quality testing (outdoor component and lab work) for 1 hour (1.5 hour field trip)
  - Eight grade groups – talked about Virginia port and human impacts (night lights dataset)
  - Positive responses from teachers
- Sarah Lee: (*to Peter Leighton*) Are there worksheets related to SOS?
  - Peter: Don't hand out physical worksheets (used in labs and outdoor activity) for SOS
  - Brooke Hsu: We have sheets to accompany SOS presentation at Goddard and will be happy to share (focus on air quality)
- Abbey Spargo: Work with student groups for an hour
  - Use a global map worksheet and ask students to find converging/diverging boundaries
    - Copy what they see on the sphere and keep worksheet
    - Have also worksheets for college classes to incorporate interactive while in the sphere room
- Matt Benjamin: Key is the follow-up – addressing SOS content in the classroom before/after visit
- Susan Pion: Combine on-site programming with video conferencing as a preliminary activity before visit
  - 1 hour class visit that has 20 minutes in the sphere and 40 minutes with hands-on activities and sometimes a follow-up video conference
  - Have seen that the sphere is translating well for the students across the video conferencing
  - Middle school age groups
    - “Reasons for the seasons” as one program
- Kirk Bergstrom: Interactive Earth could provide pre/post activities, allow classes to preview datasets, going into deeper analysis after students visit the sphere
- Who facilitates the sphere when classes visit (museum or teacher)?
  - Sarah Lee: Transitioning from museum staff to teachers (giving teachers training to use the sphere)

- Brooke Hsu: Same thing going on at Goddard (teacher controls the sphere)
      - Works better when teachers are willing to get training on it and come repeatedly
  - Matt Benjamin: Blend the sphere into university curriculum by working with professor beforehand
    - We maintain presentations, but use classes to drive content that addresses their curriculum
  - Abbey Spargo: Offer profession development for teachers, which includes classroom curriculum for in-class work AND sphere training
    - Most teachers take advantage of the curriculum, but not learning how to use the sphere
    - Workshop is 10 hours (not all at once) (“content institutes” that focus on elementary school teachers) with additional optional sessions to learn how to use the sphere
    - Do you really have teachers that want to come more than once?
      - Abbey: Teachers that have learned to use sphere are working with Global Learning Charter Schools – more flexibility within classroom, can visit museum repeatedly
  - Matt Benjamin: No funding for field trips is a problem (also for other institutions)
    - Need other avenues to get funding for classes to the museum
    - Moving from “being nice to being necessary” as a science learning center
  - Sarah Lee: Hosted two days of Alaska math and science teacher conference
    - Showed them what the sphere can do
- Pat Hamilton (*Moderator*): Teachers bring classes to institution and someone on staff facilitates interaction with SOS. Have you had teachers encouraging students to visit on their own time?
  - Doug Duncan: “Hands-on homework” – encourage university teachers to assign homework that requires visiting the museum (schools are close by)
  - Pat Hamilton (*Moderator*): Professor at University of Minnesota that offers extra credit to students to come to museum to do activities, some related to SOS
    - Students seldom go alone – will find a friend to go with them
  - Leon Geschwind: Student create content and put it on the sphere as an assignment (university level classes)
    - Pat: We have done that in the past
    - Brandan Lanman: We have hired docents (local students) from local university (UCF) that have the job of creating content on sphere that is related to research they are doing
- Path Hamilton (*Moderator*): Examples of evaluation?
  - Sue Guevara: No formal evaluation on workshops yet (workshops on using the sphere)
  - Pat Hamilton (*Moderator*): Classes from St. Katherine, St. Thomas (local colleges) – we have a back-to-back survey that professor administers to class before and after visit.
    - Get very good response rate

- Questions include: Did SOS experience help the students better comprehend concepts from the class? Also asked pragmatic questions (have you visited the museum before, how long ago, did SOS make you want to return to the museum, etc.)
- Heather Barnes: Do other guests drop in or do you give exclusive show for the visiting classes in your museum?
  - Pat Hamilton (*Moderator*): I encourage professors to come when the museum is slow (afternoon) and they can control the visualizations but they do not have control of the space (people can come into the space and ask questions, etc.)
  - Peter Leighton: We have regular public programs and school programs at different times
    - School program takes priority of the area, but at slow time in museum
  - Abbey Spargo: Post schedule online a week in advance
    - Do not allow public into SOS room due to liability issues during school programs
  - Sarah Lee: Also have liability issue (don't post which school is the museum at what time)
  - Ilka Porter: No sphere yet, but we have talked about getting pre-service teachers into the SOS room and work on geography, science education standards
    - Matt Benjamin: We tend to hire students that are prospective science teachers (cooperative learning system ("LA") at Colorado University that is designed to have students help other students learn)
- Pat Hamilton (*Moderator*): What do we need in order move forward as a network in advancing our relationship with formal education? Prioritize – what are the top 2-3 needs in this area?
  - Brooke Hsu: We attempted preliminary evaluation of what information already exists in network with regard to formal education → proposes increased communication and sharing about activities in this area
  - Matt Benjamin: Issue is that science standards differ by state
    - One-stop shop then is limited because materials would have to be too general to cover all standards, grades, etc.
    - Pat Hamilton (*Moderator*): We could have something network-wide where you could see what institutions are doing and then you could contact the relevant institutions (rather than posting network-wide materials for specific SOS school programs)
    - Brooke Hsu: This could user-generated, simple posting of materials online
  - Heather Barnes: Have had professors ask for SOS presentations specific to a certain class
    - Would like to know how other institutions deal with ticketing, programming etc. → a best practice document
  - JMU: It would be ideal to know what is suitable for different grades (is this dataset short enough, interesting enough, etc. to keep interest of, for example, 3<sup>rd</sup> graders)?
    - Pat: That would assume that some evaluation had occurred and institution knows the program is relevant to standards for that grade
    - Matt Benjamin: It is overwhelming to teachers to present everything you have to offer (overwhelming)

- If you know what fits the standards, you can show them only what is relevant to the grade they teach
  - Sarah Waters: Maybe a “most-popular” list? What are the top five datasets that we see most often for third graders?
  - Ilka Porter: Connection to national science education standards (or ocean literacy standards)?
  - Leon Geschwind: Mechanism for people to upload scripts, pre/post lessons and then get feedback from network
  - Sarah Lee: Who else to talk to on how to work with very young kids (including preschool)?
    - Boonshoft does a lot of that (Susan Lion)
- Pat Hamilton (*Moderator*): How many have classes coming just to see SOS?
  - Most people in the room raised their hands
  - Many classes book the SOS room and then also visit the museum
  - Gary Randolph: When classes book time in SOS, do you they come with specific goals or just to see what you run?
    - Many have people coming with specific goals
    - Matt Benjamin: With new teachers, you have to really ask to figure out what they need out of the visit (have them email their syllabus, etc.)
      - Most classes visit at specific times of year (after state testing, toward end of the year) – can plan for it
      - Personalize SOS program for each individual class
- Is there a way of creating a simple evaluation/survey document that we could all use in order to get data back across network about how teachers perceive SOS adding value to their curriculum? Anyone interested and willing to use a standardized survey or to insert those questions into your own survey?
  - Brooke Hsu: Caution that teachers’ perceptions on student learning were always higher than what pre and post tests showed
  - Sarah Lee: Willing because I don’t have time to generate my own survey
  - Ilka Porter: People have teachers pick what their class will see?
    - Sue Guevara and Abbey Spargo: Use a stock of programs that teachers can choose from
  - Sarah Lee: We are the opposite – we customize for every teacher because we don’t know a lot about what teachers need
- Pat Hamilton (*Moderator*): Pre and post activities – use and interest?
  - Susan Pion: We use activities and video conference
  - Luann Dahlman: It would be great to have a repository where institutions could share their pre/post activities and organize them by grade or dataset used
    - Over time, we could get a little funding and have a teacher summer workshop where they look at what has been shared and work on improving them
  - Leon Geschwind: We developed these pre/post lessons when we first started

- Teachers don't have the time in their classroom → realize that one lesson pre and post might be more than enough
- Abbey Spargo: Pre-activity is very simple (word splash, vocabulary list and a teacher pre-survey)
- Gary Randolph: Does anyone use NEO images and do you think the GLOBE poster would be a useful pre-activity?
  - A lot of NEO are formatted for sphere and poster would be helpful (Abbey Spargo and Brooke Hsu)

**Recommendations to NOAA (Office of Education, Earth System Research Laboratory, National Visualization Laboratory):**

- Create a summary of what institution does with regard to formal education and provide contact information to facilitate communication across network
  - Group also interested in posting materials online to share
  - Provide a mechanism for people to upload scripts, pre/post lessons and then get feedback from network
  - It would be great to have a repository where institutions could share their pre/post activities and organize them by grade or dataset used
- Create a “best practice” document for working with formal education
- Generate a “most-popular” list: What is the top five datasets that we see most often for specific grades?
  - Include connections to national science education standards (or ocean literacy standards)?
- Is there a way of creating a simple evaluation/survey document that we could all use in order to get data back across network about how teachers perceive SOS adding value to their curriculum?
  - Interest level about using a standardized survey (or to inserting those questions into your own survey) not certain

**Actions/Next Steps:**

<i>Action/Next Step</i>	<i>Responsible Network Member/Institution</i>

**Research Questions for Further Exploration:**