

**Learning Technologies
Breakout Session at CAISE Conference 7/26/08**

What are folks working on (modes):

- Websites
- Exhibits
- Games
- Virtual Worlds/Communities
- Audio/Video/Visuals
- Multimedia
- Mobile Technologies

What they do (focus):

- Content Delivery
- Data (input/sharing) -> Researching
- Professional Development/Training
- Virtual Worlds/Communities

Questions and Concerns about the Framework:

Establishing common/foundational questions/metrics:

- If overarching goal is to inform congress of performance, we need to define one/a few overarching questions that apply to all and help tell the story
- Assessment points for new learning technologies
- Baselines and benchmarks – do they exist/and how do we find them? (Need study group, project to research effective scalable benchmarks for the web as a field (i.e. Google Analytics vs. sophisticated evaluation surveys/focus groups)
- With technologies changing so quickly, how can the research to develop the metrics for success ever keep up?
- Can ISE develop metrics for effectiveness of different technologies to gauge learning success?
- Worried about outcomes that we can state but can't quantify
- How can you assess if your audience learns to use scientific inquiry in their daily lives, beyond your project content?
- Are there any baselines or benchmarks for participation rates in any online communities much less ISE ones?
- Lots of online resources take a while to get indexed by, say, Google – hard to sustain funding for operations that allow for the development of new things (i.e., use of a website as a platform for a new feature, but have to sustain original website too).
- How does American “sound-byte” learning compare to science education quality in other countries?
- Do learning technologies have enough in common to be lumped together for assessment/evaluation purposes? (At the higher levels, yes they do, at the drilled-down level, there are substantive differences)

Web-specific questions:

- Web-metrics – what is most useful?
- How do I build assessment into the website (hits and beyond)
- For websites the ability to accurately assess impact for a poorly understood, largely inaccessible audience
- How do you track learning for people who just visit site to view it?

- Examples in learning technology doesn't cover websites/social media that don't require registration
- After visit home web use as assessments
- Building a persistent visitor experience from museum visit to home
- Design-based research of interactive designs for web activities

Virtual Worlds/communities questions:

- What connections can people make between virtual worlds and the real world?
- How do we assess the success or failure of online learning communities?
- How do you mine a rich forum for data without overwhelming yourself?
- How do we evaluate the value of learning traveling back and forth between online and the facility?
- How does virtual science learning compare against "hands-on" in training scientists of the future?

Game-specific questions:

- Games as performance assessments
- Customized simulations as assessments

Mobile Technologies:

- For those of us with GPS and other tracking technology, how can we utilize the data collected to inform the field?

Audio Technologies:

- How to assess the impact of audio delivery

Logistical questions:

- Is there a way to use the information entered from program monitoring system into Fastlane?
- What type of documents will we be able to retrieve after entry?
- Is there a way to see aggregated data entered into the system?
- Can it be set up so we can export our data and __?_ it somehow?
- What are the relative costs per student of different technologies?
- What is the cheapest technology to reach the most people?
- **What if it doesn't work:** Loss of focus on good stories/strong content (proven format) in favor of new technologies and formats?

Positive thoughts:

Reach

- Global reach of the Internet
- Technology can allow us to reach more people with less expense (esp. languages)
- The web is a wonderful tool for building learning environments

Promotional:

- Rich online experiences that drive visitors to the museum to explore their results
- New revenue streams (instead of fearing decrease in visitations, think about revenue streams from entry fees or website memberships)

Accountability

- It will help me to be accountable to decision-makers locally
- Accountability

Issue: do topics have enough in common to be considered as a “lump”?
Comparisons are not always appropriate

Attendees:

- Exploratorium (museum): visualization, exhibits, web-based content
- U Central Florida: scalable technology from laptop to large exhibits (virtual distance learning, web, laptop, mixed reality) in a museum context
- National Park Trails: GPS, other digital content, audio, web visits, virtual trails
- Meadowlands Env. Center: Website (pre/post visit info), audio tours, web journals
- Miami Science Museum: Handhelds, web reports, web dissemination (visit data and online data reporting), online professional development
- UNH: large databases, picture post, virtual networks. Research on global climate change and connect people and data – take pictures over time of landscapes (vibrant online virtual community)
- Pittsburgh: online professional development
- Minnesota Zoo: Wolf quest – game and online community
- Philadelphia museum of Art: teach HS Chemistry through Art – Online dissemination of book, multimedia
- American Museum of Natural History: HD exhibitions, distribution of content and tracking distribution on different platforms (how to track: who’s accessing and what’s the impact)
- Games: mini games, kids as designers museum and online
- University of Maine?: Master naturalist – volunteers entering their experiences online, asking the right questions
- Penguin Science: interactive website
- New College FL: get researchers involved in education and understand how kids learn through metrics, rainforest, technology for research – training and content delivery
- Space Science Institute – Space science educational websites, physics-based simulations, games (coded to collect data)
- Science museum of MN: science buzz, emerging news on web, mobile technology, how to collect metrics from museum visitors about exhibits visited. Museum/online, mobile technology, audio tour

Notes from conversation:

Positive thoughts:

- 1) cost effective - but is it really (at least at first, how do you know what to measure/how to measure it?)
- 2) learning environments: web is a good face to the general public

- 3) Increases your reach (or does it?)
- 4) Increases accountability in results

Problems with the web: does it increase or decrease museum visits? The virtual world may compete with the on-site world, can they co-exist? Would visitors be willing to pay entry fees to online museums? Is there research on how web presence affects visitation? Quality of the web site is crucial, as is the intent: does web drive visitors to a deeper experience at the facility or provide an interactive experience online? Can web provide the deeper levels of understanding as an immersive experience does?

Core Questions:

- lump or separate learning technologies
- Baselines and benchmarks – what are they?
- Online audiences are elusive – how do we get to them?
- What web metrics are useful?
- Can I design assessment into the website?
- How do you mine the data once you have collected it? (Smart search tools do exist)
- List of evaluators who know or are interested in doing web or dialogue analysis would be helpful (proposes need to ask evaluators good questions and check their publications before choosing)
- Will NSF be flexible in evaluators costs to projects?
- Can this group make a proposal to NSF to do research on the impact of different resources and sharing so that every project doesn't have to propose to do everything?
- We need to create a whole new vision for the field, not just innovation for individual projects
- Can we partner with businesses to help us learn more about web text input? We don't have the scale, but they do (Creative text mining is beyond us, but business community is developing tools that we can use to extract meaning from text input)
- To register or not register users?
- How do you assess success or failure in online communities?
Think beyond data you know you can get
- Can we export data from PMS?
- Challenge is to create a baseline of evaluation data for projects that are new in the field and difficult to compare with others
- Informalscience.org can help facilitate an online community on these topics and tools to aggregate data into useful information
- Standardized metrics vs. your own developed metrics? – Standardized probably not appropriate for learning technologies as they will be bleeding edge and hard to pigeon-hole.
- Can we use performance-based assessments for formal educational uses?
- Can your web statistics (or exhibit) be used in an activity? (data follows learners through environments and can it be used for other life experiences?)

- Research on failed exhibits is useful in helping the field fix problems in design and how the exhibit and public interacts
- NSF will post a wiki for ISE folks to interact and not be out there alone.

Summary:

- Opportunities to combine efforts as much as possible (build on, rather than duplicate findings obtained by other groups)
- Sharing can be scary at first (long-held belief that info is proprietary) - but starting to see the value of sharing
- Being among the first to be asked to adhere to these new levels of accountability seems daunting at first (and there are many questions) but most were able to see some value in modifying their assessment practices as well
- Think outside the box – find new ways to show what you are doing/why it works
Okay if things don't work – that's an important finding too
- PIs like the idea of being able to converse with one another and collaborate on strategies or share ideas and findings