Practitioner Perspective
Reflections and Questions for the CAISE Convening on Evaluation and Practice
Rachel Hellenga
Hellenga Projects, Rachel@hellengaprojects.com

<u>Improving Practice through Reflection:</u>
The summative evaluation process is not the last stop of a major project, but a stepping stone to reflection and dissemination. If we reframe the summative evaluation report as a tool for reflection, we can address the common perception of the summative report as just a formality, a "grade" and a judgment of the team's performance. To that end, it's important to ensure that our summative reports contain actionable information with the potential to improve future projects and to inform others' work.

Discerning and disseminating insights about effectiveness of the project design can go well beyond patting ourselves on the back and filing away a report to the funder. Which aspects of a given project should be replicated and translated into best practices? Which promising strategies led to a dead end? Making evaluation studies more "researchy," to borrow a term from Rick Bonney at the Cornell Lab of Ornithology—involves going beyond the question of "Was my program effective or not?" to tease apart the project results in a way that will bring meaningful insights to the project team and the field—without necessarily incurring the expense and extended time frame associated with academic research.

Specific choices in the design process can result in almost miraculous levels of engagement and learning; and without "researchy" evaluation, those subtle choices can be identified and set apart from similar-looking projects which may still look like an exhibit full of engaged visitors, or a TV show with the same level of audience, or a demo that generates the same level of applause, but which may only be keeping people busy. ***How can we make those differences in quality more visible? How can summative evaluation routinely incorporate reflection that helps us to take the right lessons from prior projects, and frame the report itself as a tool for reflection and discernment, not a grade or a judgment?***

By the same token, teams can push researchers to take a more pragmatic approach, asking them to spin off informal and practical recommendations earlier in the course of a project. ***How can researchers accommodate project teams and see their own work translated into action--without compromising the rigorous study design required for academic publication?***

<u>Dissemination is Everyone's Responsibility, including the "disseminee"</u>
Thinking about dissemination at the *outset* of the project will be more likely to result in gathering the right materials along the way and budgeting for the reporting formats that will be needed from the evaluator. ***I would argue that evaluators can play a larger role in prompting Project Leads to think about dissemination from the start, but if projects***

have a cap on the evaluation fee, perhaps introducing dissemination deliverables might cut into the funds available to cover research. Who is in the best position to advocate for dissemination and keep it at the forefront throughout the project?

It's important to share concrete stories of how disseminating dead ends helped other colleagues. For example, many other museum exhibition projects evaluated two levels of labels, one written for children and one for caregivers, only to find that everyone reads the labels aimed at the kids. Those summative evaluation reports saved me from going down the same mouse hole. **This is an area where Project Leads can help their evaluators, by resisting the temptation to gloss over negative results in the report. How do evaluator-project leads navigate this sensitive territory?**

And for your next project...be a good "disseminee" Getting the word out takes active disseminator AND active listeners looking for this information AND responsive practitioners open to reflecting on and refining their practice. Practitioners have a responsibility to build on prior work, and casual observation of others' work product followed by replication at one's own institution is not a robust strategy. It's far better than forging ahead with no attention to others' work, but if we replicate projects without uncovering the links between design decisions and results, we do so without the benefit of knowing which ingredients are essential and which are superfluous. **I would love to discuss how evaluators, who typically see many more projects annually than staff at a single museum, could help to contribute to the "literature search" conducted by teams as they kick off new projects.** In the world of academia, the publishing process requires citations of prior studies to ensure that researchers don't conduct redundant studies in different parts of the country or at different points in time. Similarly, advertising agencies learn from each other and analyze reams of data to determine what works--a2013 television ad relying on strategies from the 1950's would seem unthinkably clumsy and unsophisticated. And yet many informal science education programs are introduced every year without building on prior work; not necessarily at the level of NSF-funded projects, but other examples abound. **What mechanisms could we put in place to leave breadcrumbs for people new to the field, and to lead them to the most seminal and influential projects as well as the most recent advances? A wiki of past institutional projects with a recommendation engine? A requirement (when uploading the summative reports)to provide a list of projects which most influenced the team?**

Improving Practice: Translating good practice into "checklists" that prevent bad practice

I would be interested in others' thoughts on the proportion of time and energy (and funds) we invest in generating new knowledge about innovative methods for fostering learning in end users, vs. time spent on research into effective strategies for fostering learning and behavior change in practitioners, and effective systems for maintaining and building on the work achieved by the field. Just as we want to dispel misconceptions about science in the general public, we need to dispel misconceptions about effective informal learning strategies among practitioners.

It seems that we focus a lot of attention on the work happening at the top of the pyramid of expertise and practice, where folks are developing and testing ever more nuanced informal learning strategies. But **how about poking around at the bottom of this pyramid to learn about how to prevent the worst bloopers and avoid squandering resources on the development of mediocre programs** in the very communities that most need effective informal STEM education?

In a number of situations, projects might underestimate their visitors and present edutainment that falls short, or use ineffective strategies to present content that goes right over people's heads, leading to expensive and time-consuming placebos. New products are generated each year that repeat old mistakes, entrench gender stereotypes, reinforce basic science misconceptions, and so on. And while some of this can be attributed to disparity in resources and access to professional development, these bloopers cut across the field. (I coach label-writers using a collection of images of great examples of well-written exhibition text and well-designed graphic panels along with bloopers and "don't do this" examples—in some cases the good the bad and the ugly all came from the same museum.)In some cases it's a question of "knowing what to do," and in other cases it's a matter of "doing what you know."**What structure can we put in place, and is there a role for evaluators in setting standard operating procedures?**

*Checklists ensure we "do no harm."*I have been very inspired by the simple checklists that are transforming medical practice. These checklists address process, not outcomes. Checklists are boring. They do not lead to new miracle cures; they just bring up the rear and stop bad things from happening. But hospitals are radically reducing accidental deaths and a variety of preventable infections simply by requiring medical professionals to refer to checklists as they complete certain procedures. Doctors study hundreds of textbooks as part of their training. They get plenty of hands-on practice. Yet it turns out they still need simple checklists to keep from killing people whether through lack of hand-washing or by transplanting the wrong kidney.
[http://www.newyorker.com/reporting/2007/12/10/071210fa_fact_gawande] Maybe we should take a lesson from that. **How could the "hospital checklist manifesto" approach be developed and used by project leads and evaluators?**

Drop a word, gain a reader, to quote Beverly Serrell's approach to writing exhibit labels. Don't throw out the books and long reports, but add to our arsenal with infographics and short lists. **What would STEM education checklists look like? And what would a research study look like if we measured cost-effective strategies for to "bring up the rear"?**

"Identification of best practices": the subject of a meta-research project?
Maybe we start with meta-research based on the vast quantity of summative evaluations which are now neatly sliced and diced and tagged according to a controlled vocabulary in the new informalscience.org database. I'm very excited about the new and improved

informalscience.org site because the existing summative reports have been tagged using consistent terms which will also apply to new reports as they are uploaded. This means **we can slice and dice the database to pull up evaluation reports filtered by the age of the project's intended audience, type of ISE project, subject matter, etc.—I hope some new proposals will come forward on this topic.** The Building Informal Science Education (BISE: http://visitorstudies.org/bise) project is taking a first pass at reviewing the data and I would like to know about their findings.

"Best practice transfer": the subject of a meta-research project?
Could the issue of uneven delivery of programming pose a research opportunity? We talk about bridging the gap between research and practice, but I'm talking about research on practice, and on closing the divide between reasonably good practice and preventable bad practice. Cleaning that up might have an equally positive impact as inventing the next great learning strategy. **How can we ensure no ISE program drifts below a baseline of acceptable best practices?** Low-cost interventions addressing professional practice in STEM education may not save lives, but they can certainly change lives. When I attended high school in Italy, even average performance could cause a student to be held back a year, so the class of thirty students all pulled together to make sure they made it through five years without losing anyone. I discovered that the word for "cheat" was never used— instead the word "help" (aiutare) was used to describe the act of the students giving a little unofficial assistance to their struggling classmate. What support could we put in place to ensure that all of our peers are performing at the highest standard? As Emlyn Koster has put it, "a high tide raises all boats."

Maker Spaces: a new opportunity for research and evaluation?
Throwing one last topic onto the discussion heap: How can we learn from the most effective facilitators in Maker Spaces and break down their "facilitation magic" into visible behaviors and repeatable language that makes it possible to train highly talented engineers and other volunteers? And what can we learn from unstaffed exhibits focused on construction, engineering, design or inventing processes (e.g. with challenges and loose parts), that could be imported into Maker Spaces not as a little "exhibit lobby" but right inside with the laser cutter and the 3D printer, in order to engage visitors in a range of ways even when the visitors vastly outnumber staff on crowded days, or when there are very few or no staff assigned to the space on slow days?