

Broader Impact Statement: Example One for Discussion



[Liesl Hotaling](#)

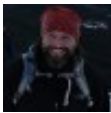
May 2010

Please comment on your thoughts/evaluation of the following broader impact example. What are the merits? If you were a panelist, would you consider this a robust BI activity? Why or why not?

Our goal is to facilitate the use of the general concepts and research developed in this study to serve as educational lessons that address the Ocean Literacy Principles on the middle school and high school level. These research-based lessons will promote critical thinking and analytical skills through the comprehension of basic scientific principles, as well as meeting state standards in science and mathematics.

We will collaborate with XXXX on a series of informal and formal activities for students, teachers, and the general public. We plan to mentor and support a XXXX alumnus as an education consultant to develop a data oriented lesson plan for National Marine Educators Associations' (NMEA) Bridge website (www.vims.edu/bridge).

This website is the most broadly used web resource for K-12 educators looking for marine and coastal lesson plans and demonstrations. Educators who have completed the XXXX program are experts in educating students in the geosciences, and are therefore ideal go-betweens to translate scientific research into concepts and lessons for students and the general public. As part of the presentation of this lesson plan on the XXXX and Bridge websites, we also plan to serve as an online "scientist in residence" to answer questions and hold discussions with educators using the online materials. We also plan to serve a similar function for the XXXX program as part of their teaching curriculum.



[Britt Holbrook](#)

May 2010

This is certainly well above average for a response to BIC. There's evidence that the proposers have thought about integrating their own research with the BI component, and they intend to partner with folks with appropriate expertise. So, they don't have to start from scratch and can concentrate on integrating their research with an EPO program that's run by experts. That's one mark of a savvy writer of grants. I do have some suggestions for how to improve it. But I'm curious to see what other participants say first



[Sharon Franks](#)

May 2010

Among the merits of this BI statement: It addresses the first of the five BI questions – the one that asks about promotion of teaching, training and learning. Plans include a collaboration by the research team with an established educational organization.

Some shortcomings of the statement:

1. The goal, as stated in the first sentence, is uninspiring. There's no mention of intended impact in terms of learning by students. Could goal as stated perhaps be better recast as an objective?
2. Lack of discussion of the need for the proposed lessons. The plan would be stronger if the writers demonstrated awareness of existing resources, if any, and the potential shortcomings of the existing resources that the proposed lessons will address. Reviewers may have concerns about wheel-reinvention.
3. The statement lacks detail about scale and scope: How many lessons/activities of what length/depth will be developed? Which OL Principles will be addressed? How often and how long will the online question-answering by the "scientist-in-residence" take place?
4. Roles in the collaboration are vague, especially the roles of the scientist(s): How, if at all, will any

member of the research team contribute to the development of proposed activities? Use of the term “scientist in residence” may be a bit of an overstatement, unless the “residence” is of longer, sustained duration than that suggested in the write-up. Qualifications of the “education consultant” may be questioned, given the statement about the individual being mentored.

5. No assessment plans: Will – and if so, how – will the impact of the proposed activities be measured or otherwise documented? What evidence exists that “this website” effectively serves the target audience – middle and HS educators? Perhaps this is addressed in an appended letter of collaboration.

As a reviewer or panelist I would regard this as a mediocre BI statement.



[Chris Parsons](#)

May 2010

First, I’m not clear if the audience is students or teachers, or both. This statement could be much stronger if grounded in the ed literature regarding how well what’s proposed fits with what the ed research says works. Is this the way to promote critical thinking and analytic skills? Plus, what are your plans for piloting and refining lessons and activities to ensure they work toward your goals?



[Britt Holbrook](#)

May 2010

It’s really interesting to me to read Sharon’s comments, which are both helpful and critical. If only all reviewers were so demanding! We certainly would have much better responses to BIC.

In general, however, it is not the case that most reviewers are so demanding. In fact, most reviewers don’t know what to do with BIC any better than most proposers. If you doubt this, go check out the reports of the Committees of Visitors, which as a group show a decided lack of quality in reviewer attention to BIC. This is NOT, however, a reason to slack on your broader impacts statement. In fact, it’s a reason to make yours shine all the more brightly.

Why so? A constant refrain from NSF is that they receive far too many good proposals to fund (that is, they don’t have enough money to fund all of the ‘fundable’ proposals). What that says is that they’re getting lots of proposals of high intellectual merit, and often the choice to fund one proposal or another will come down to something OTHER than simply intellectual merit. If there are many proposals with essentially equal intellectual merit, the easiest way to determine which proposals to fund would be to move to a comparison of the proposed broader impacts.

In other words, if there are two proposals with equal intellectual merit, but one of them has far superior broader impacts, my money would be on the one with the better response to BIC every time.

But, wait — if reviewers don’t know what to look for in BIC, then how will they be able to discern better broader impacts? First, I suspect that most could folks could tell that one of these BI statements was worse than 2 of the others, and that we could probably reach a consensus on which of the 3 was best. Second, other folks are figuring out that BIC can act in this way as a tie-breaker, and so broader impacts statements are slowly improving over time

It’s interesting, also, to note Chris’ claim: “This statement could be much stronger if grounded in the ed literature regarding how well what’s proposed fits with what the ed research says works.”

Well, I don’t know about you other non-ed specialists, but one reaction I have to this statement is: Hey, how am I supposed to know the education literature?!

But this highlights one of the most important pieces of advice regarding BIC — if you are proposing something that requires expertise in a particular area (say, education), then you better get someone on your team with expertise in that area!

I don't see this sort of interdisciplinary teamwork happening as often as it should, which, again, is another reason to engage in interdisciplinarity in this way.

Imagine what would happen if someone with expertise in education is included as a reviewer — on a science proposal, not on an ed proposal. This idea often strikes people as odd, though from talking with folks at COSEE, it seems that it is happening more and more often that NSF Program Officers will have someone who's an expert in broader impacts as a reviewer.

I'm interested to know whether anyone has encountered this. Anyone who's an educator been asked to review a science proposal? Any scientists ever been reviewed by an ed specialist (or think you were)? Any scientists ever serve on a review panel with an ed specialist, or someone else with relevant BI expertise?



[Chris Parsons](#)

May 2010

Yes, definitely, teaming with someone who knows what they're doing and knows more than you is a big help. To add, if you're really interested in pursuing education/training as part of your broader impact, here are some current National Academies Press and other publications that'll give you grounding in formal education, informal education and teacher professional development.

- Bell, P., Lewenstein, B., Shouse, A.W., et al. (Eds.). (2009). *Learning Science in Informal Environments: People, Places, and Pursuits*. Washington, D.C.: The National Academies Press.
- Donovan, M.S. & Bransford, J.D. (Eds.). (2005). *How Students Learn: Science in the classroom*. Washington, D.C.: The National Academies Press.
- Fenichel, M. & Schweingruber, H.A. (2010). *Surrounded by Science: Learning science in informal environments*. Washington, D.C.: The National Academies Press.
- Loucks-Horsley, S., Love, N., Stiles, K.E., et al. (2003). *Designing Professional Development for Teachers of Science and Mathematics* (2nd ed.). Thousand Oaks, CA: Corwin Press, Inc.
- Michaels, S., Shouse, A.W. & Schweingruber, H.A. (2008). *Ready, Set, Science! Putting research to work in K-8 science classrooms*. Washington, D.C.: National Research Council.



[Chris Petrone](#)

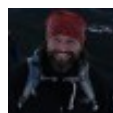
Jan. 2012

Britt, Chris, Sharon, and Liesl,

Even after being posted almost two years ago, I have found in the information contained in these three examples to be of tremendous help in assisting a scientist with Broader Impacts for her NSF proposal. Fortunately, she invited me, an education specialist, to the table early, which allowed me time to really research what goes into strong BIs.

Thank you so much for providing this great insight; I learned a ton and hopefully have helped create a successful proposal.

Highest regards,
Chris



[Britt Holbrook](#)

Jan. 2012

Very cool! Now we'll have to figure out just how much of the advice pertains to the newly revised criteria. Check out my posts here starting January 11 for some preliminary thoughts: <http://cas-csid.cas.unt.edu/?cat=42>.



[Chris Petrone](#)

Jan. 2012

More great information, and quite an interesting "conversation." I think the above advice in the

three examples still holds despite the new changes.

A blank slate which can be filled with all of the project staff's great ideas for reaching a broader audience, just like the slate we have on the science side of the project? Instead of an a la carte list of ways to get our science out there?

A novel concept indeed.



[Britt Holbrook](#)

Feb. 2012

@ChrisP: totally right about the blank slate, though I prefer to call it freedom! Here's hoping folks will take advantage of it.