Service-Learning as a Strategy to Achieve National Science Foundation Broader Impacts

What is NSF?

The National Science Foundation (NSF) is an independent federal agency created by Congress in 1950 "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense..." With an annual budget of about $6.9 billion (FY 2010), NSF funds approximately 20 percent of all federally supported basic research conducted by America’s colleges and universities. In many fields such as mathematics, computer science and the social sciences, NSF is the major source of federal backing.

Does Boise State get NSF funding?

Yes, Boise State received nearly $10M in NSF funding in FY ‘2011.

What are some examples of NSF funded projects at Boise State University?

- Computer network to complex behaviors and biological phenomena, such as tissue regeneration; evolutionary algorithms to search for computer models that can provide insight into the mechanisms responsible for body morphing and patterning. Tim Andersen, CS; Jeff Habig, Chemistry
- Study of hawkmoths and certain noises they make to discourage predatory bats from hunting them. This study will attempt to answer how bats and hawkmoths evolved over time and what selective forces helped create the diversity in the insects that we see today. Jesse Barber, Biology.
- Research Experiences for Undergraduates “Complexity in Algebra, Geometry and Applications” introduces undergraduate students to math applications in information security or genome biology. Liljana Babinkostova, Mathematics
- Developing a novel self-assembly technique for fabricating nanoscale photonic and electronic devices. The approach is to use a single strand DNA designed to be self-assembled into a two-dimensional nanobreadboard. Bernie Yurke, Materials Science

What are the main NSF review criteria?

1. Intellectual Merit

   How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of prior work.) To what extent does the proposed activity suggest and explore creative, original, or potentially transformative concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

2. Broader Impacts

   How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?
Service Learning definitions

"Service-Learning is a teaching strategy that integrates course content with relevant community service. Through assignments and class discussions, students critically reflect on the service in order to increase their understanding of course content, gain a broader appreciation of the discipline, and enhance their sense of civic responsibility."

*Boise State Service-Learning Program*

"Service-Learning programs emphasize the accomplishment of tasks which meet human needs in combination with conscious educational growth."

*Southern Regional Education Board*

"Service-Learning emphasizes reciprocity-- between campus and community -- between those who serve and those who learn. Service-Learning is an approach to experiential learning and expression of values - service to others, community development and empowerment, reciprocal learning - which determines the purpose, nature and process of social and educational exchange."

*T. Stanton, NSEE*

"Service-Learning helps participants see their work in the larger context of issues of social justice and social policy - in addition to the context of philanthropy and charity. What aspects of our social reality present the needs we respond to as volunteers?"

*Adapted from J. Kendall, NSIEE*

Take the Broader Impacts Quiz!

Keeping in mind the above definitions of Service-Learning, how well do you think a S-L project could fulfill each of the tenants of NSF Broader Impacts, on a scale of 0 to 4?

<table>
<thead>
<tr>
<th>Pertinence to Service-Learning</th>
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<td>0 = None to 4 = Extremely Applicable</td>
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<tr>
<th>1. How well does the activity advance discovery and understanding while promoting teaching, training and learning?</th>
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<td>2. How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)?</td>
<td>0</td>
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<td>3. To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks and partnerships?</td>
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<td>4. Will the results be disseminated broadly to enhance scientific and technological understanding?</td>
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<td>5. What may be the benefits of the proposed activity to society?</td>
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