Integrating Broader Impacts into your Research Proposal

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Recommendation for Change

‘Research directorates should expand resources for educational activities that integrate education and research.’

-Shaping the Future, NSF, 1996
Demand for Change

‘Effective October 1, 2002, NSF will return without review proposals that do not separately address both merit review criteria within the Project Summary. We believe that these changes to NSF proposal preparation and processing guidelines will more clearly articulate the importance of broader impacts to NSF funded projects.’

- Important Notice 127
Evolution of NSF’s Vision

1995: “Enabling the nation’s future through discovery, learning, and innovation.”

2006: “Advancing discovery, innovation and education beyond the frontiers of current knowledge, and empowering future generations in science and engineering.”

National Science Foundation - Investing in America’s Future Strategic Plan - FY 2006-2011
Broader Impact of Your Research

While it is important to describe the significance and impact of your research…

…talking about the impact of your research alone is NOT sufficient to satisfy NSF’s broader impact criteria
Defining ‘Broader Impact’

How well does the proposed activity:

- Advance discovery and understanding while promoting teaching, training, and learning?
- Broaden the participation of underrepresented groups (e.g. gender, ethnicity, disability, etc.)?
- Enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships?
- What are the benefits of the proposed activity to society in general?

See examples from each category in your materials
Some Example Broader Impact Activities

- Develop, adopt, adapt or disseminate effective teaching models in STEM classrooms
- Participate in programs that recruit and train K-12 science and math teachers
- Partner with researchers and educators to develop effective means of incorporating research into learning and education
- Include students from underrepresented groups as participants in the proposed research and education activities
- Partner with museums, nature centers, science centers, and similar institutions to develop exhibits in science, math, and engineering
- Give science and engineering presentations to the broader community (e.g., at museums and libraries, on radio shows, and in other such venues.)
Elements of your broader impact plan (see worksheet)

A *good broader impact plan will have*:  
- Explicit objectives
- Stated relationship to scientific research
- Understanding of intended audience
- Specific and feasible implementation plans
- Connectivity to existing networks
- Evaluation plan - did you accomplish objectives
Insights from Review Panels

- Applicants reviewed in blocks based upon stage in education
  - expectation of research experience and accomplishments is commensurate with stage of education
  - all senior undergraduates reviewed first
  - first-year graduate students
  - second-year graduate students
Insights from Review Panels

General review guidelines:

- Intellectual Merit
  - high standards for academic performance
  - research expectations dependent upon both education stage and availability of research opportunities
  - you MUST be able to clearly communicate the motivation, purpose, and general plan for your research
  - do NOT assume that the reviewer has any background knowledge in your specific research area
  - make sure you do not have any conspicuously absent reference letters (i.e., from your past or present research advisors)
  - for later-stage applicants, evidence of research productivity is crucial
Insights from Review Panels

- General review guidelines:
  - Broader Impact
  - integration of broader impacts throughout?
  - demonstration of knowledge of what constitutes broader impact activities?
  - evidence that you will follow through with your proposed activities?
  - past participation in broader impact activities? leadership or initiative in these activities?
  - does not need to be astonishingly novel – but should be meaningful, feasible, and have the potential to impact broad and/or diverse audiences

- Overall: How well has the applicant done given the hand they have been dealt?
  - not everyone has the same opportunities – has the applicant taken advantage of the opportunities available to them?
What do YOU get out of this?

- If you receive the funding:
  - a pretty nice stipend
  - prestigious award
  - ability to choose amongst a greater number of labs/advisors
  - advisor happiness
  - supported plan for engaging in broader impact activities

- Even if you do not receive the funding:
  - experience in grant-writing and forming a research plan
  - generation of broader impact ideas that perhaps you and your advisor can still explore