

## Step 2 - Writing the Proposal

### Writing the Proposal Narrative

A good proposal is always readable, well-organized, grammatically correct, and understandable.

Be explicit in your narrative about how the program will make an improvement. This narrative must contain specifics including details of experiments and/or applications, both to show that planning has been done and to help reviewers understand why the particular application you propose is better than other ideas. You and your colleagues should think through several iterations of the definition of the project.

The narrative should be specific about the proposed activities. Reviewers want details of the project's organization, the course content, laboratory and other inquiry-based experiments, and participant activities, both to show that groundwork has been laid and to help them understand why the particular ideas you propose are better than others.

Careful writing should allow you to describe, in the limited space available, enough about your project to give the reviewers a clear idea of exactly what you plan to do and why your plan is a good one. How would the project improve education at your institution and how might it be emulated at other similar institutions? How will your plan ultimately improve students' understanding of concepts in science, technology, engineering, or mathematics? How will you know it has been done?

You must demonstrate in the narrative that you have a broad knowledge of current scholarship and activities in your field and how this is relevant to your project's design. This knowledge should include current research in teaching and learning practices. However, do not focus entirely on this aspect and fail to adequately describe the components of your project.

The project description/narrative of the proposal should be written by the person or persons in the science, engineering, or mathematics departments who will be the principal investigator(s). The submitting institution's sponsored research office or grant administration expert can assist in some areas of the proposal writing, e.g., with budgets or grammar, but usually do not have the scientific qualifications or classroom experience to describe the project in an appropriately technical or pedagogical manner.

It is helpful to reviewers to see that you have devised a time frame. This will show that you have done adequate planning and are realistic about the program's implementation.

Include examples that illustrate, for example, the innovative activities or exercises that students will be doing. Reviewers usually respond to projects that include an emphasis on active learning and student directed inquiry. In most cases, it is important to describe

your plans to continue the project and institutionalize courses and curriculum beyond the funding period.

## **Including Budget Information**

The budget request should be realistic for the project and reflect the goals of the project. It must also be consistent with the requirements of the particular NSF program. It should request sufficient resources needed to carry out the project, but it should not be excessively high.

Budget information should be complete and unambiguous. Carefully review your budget to ensure that ineligible items do not appear in the budget and that adequate attention has been given to cost sharing. Consult the *Program Solicitation* for eligible and ineligible items. Most reviewers and all Program Directors look carefully at the proposed budgets to find evidence of careful reflection and realistic project planning.

Some programs require specific cost-sharing. If required in a *Program Solicitation*, cost-sharing information must be included on line M of the budget form, and if the proposal is awarded the cost-sharing becomes a condition of the award. Remember that cost-sharing is subject to audit. Proposers may not exceed the cost sharing level or amount specified in the *Program Solicitation*; and unless required by the *Program Solicitation*, proposers should not include cost sharing amounts on line M of the proposal budget. (For more information, see the *Grant Proposal Guide* and the *Program Solicitation*.)

Make sure that your budget narrative reflects both your official NSF budget pages and the needs of the project.

Cost of the project must be realistic. Many budget requests are out-of-line with others submitted to the program. Look at the *Program Solicitation or Announcement* for average size of awards and the award range.

Budgets are often negotiated as a proposal is being considered; but a clear, realistic budget request strengthens a proposal.

## **Writing the Credentials of the PI and Other Staff**

When writing up the credentials of faculty for the grant proposal, each biographical sketch should be written with the proposal in mind and should display the unique background of the principal investigator(s) that will be valuable in working on the proposed project.

Carefully follow program guidelines about format and length of biographical sketches.

Be sure that the roles of all personnel, especially the principal investigators, are described in the proposal itself. Having the roles of the principal investigators and other personnel discussed within the narrative is important so that reviewers can understand their involvement, leadership, and commitment to the project.

If your project involves industry, consider having a co-principal investigator representing industry.

## **Including Evaluation and Dissemination Information**

A good evaluation plan appropriate to the scale of the project will provide information as the project is developing and will determine how effectively the project has achieved its goals. The effects of formative evaluation should be described. Also include how you intend to evaluate the final project and how you will determine whether this project met your scientific and pedagogical expectations.

Discuss how you plan to collect and analyze data on the project's impact (i.e., number of students or faculty affected.)

Describe why the proposed project is a good way to improve education at your institution and how it might be emulated at other similar institutions.

Explain in detail how you will disseminate information on the success and content of your project to other scientists and educators. In general, setting up a Web page about the project is not considered sufficient.

For projects that are creating instructional materials, include information on potential commercial publication. What products (text, software, CD ROMS, manuals, or other publications) might result, and what plans are in place to distribute them effectively?

Projects that include plans for commercial publication are encouraged by NSF. Authors who submit such proposals should demonstrate that NSF funding is necessary to create the work, make the product available earlier, or better serve the community.

When extensive utilization of educational technology is expected, how will the student learning outcomes be evaluated? What are the plans to ensure that electronic

dissemination will lead to broad implementation of material so provided, and that such material will be subjected to continued scrutiny for editorial quality and currency of content?

Consider the value that an outside evaluator may add to your project.

## **Letters of Endorsement**

Include letters of endorsement from your department chair and other appropriate administrators.

If your project involves other people or groups not on your campus (e.g., K-12 teachers, consultants, or other colleges), include letters of endorsement from appropriate individuals.

Include letters of endorsement with specific contributions from the participants' supporting institutions. These should make specific commitments and not just be generic support of good will. Uniquely phrased letters of endorsement from different institutions are better than nearly identical letters from the institutions to be served.

## **Project Summary and Project Data Form**

The project summary (abstract) is the first thing that reviewers and NSF staff read. It should be written clearly and concisely. In the space allotted, it should outline the problem, the objectives and the expected outcomes, project activities, and the audience to be addressed. The project summary must also clearly address in separate statements the intellectual merit of the proposed activity and the broader impacts resulting from the proposed activity. Proposals that do not separately address both merit review criteria within the project summary will be returned without review. Program Directors use the summary to choose reviewers for the proposal. It is also the reviewers' introduction to the project. NSF publishes an abstract of the project should it be funded. Considerable effort and thought should be spent in preparing a well-written summary.

The numbers given on the Project Data Form concerning student impact should be as accurate as possible. Reviewers look for discrepancies in enrollment data and the projected numbers of students. They look for reasonable expectations in those numbers.