NSF Basics: Overview, Funding Opportunities, & Proposal Writing Tips

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Session #1 Outline (1.5 hrs)
I. Introductions
II. Overview of NSF
III. Type of Submissions & Funding Mechanisms
IV. Sections of NSF Proposals
V. Proposal Review Process and Timeline
VI. Helpful Hints & Fatal Flaws for Proposal Writing
VII. Conversation - Q & A

OVERVIEW OF NSF
What is the NSF PAPPG?

The Proposal & Award Policies & Procedures Guide (PAPPG) contains documents relating to NSF’s proposal and award process. It has been designed for use by both our customer community and NSF staff and consists of two parts.

- Part I is NSF’s proposal preparation and submission guidelines.
- Part II is NSF’s award and administration guidelines.

- Provides guidance for preparation and submission of proposals to NSF.
- Describes process – and criteria – by which proposals will be reviewed.
- Outlines reasons why a proposal may not be accepted or returned without review.
- Describes process for withdrawals, returns, and declinations.
- Includes policies to guide, manage, and monitor the award and administration of grants and cooperative agreements.

Types of Funding Opportunities

- Follow the instructions in PAPPG (unless otherwise specified in solicitation).
- What to Look for: Goal of Program + Eligibility + Special proposal prep and/or award requirements
- If deadline, proposal due by 5 pm (submitter’s local time).
Types of NSF Proposal Submissions

- Research
- Workshop
- Conference
- RAPID
- EAGER (unsolicited)
- Supplements to existing awards
- Fellowship
- Ideas Lab
- Equipment
- International Travel
- Facility/Center

Sections of an NSF Proposal

- Cover Sheet
- Project Summary
- Project Description
- Results from Prior NSF Support
- References
- Biographical Sketches
- Budget
- Current & Pending Support
- Facilities, Equipment, and Other Resources
- Special Information and Supplementary Documentation

Proposal Review Process
NSF has TWO Review Criteria

1. Intellectual Merit: What will we learn? How will it advance science?

2. Broader impacts: What will the immediate or eventual impact be on society? How will it make the world a better place?

Elements of the Merit Review Criteria

1. What is the potential for the proposed activity to make a difference?
   • By advancing knowledge and understanding within its own field or across different fields (Intellectual Merit); and
   • By benefitting society or outcomes (Broader Impacts)?

2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?

3. Is the plan for carrying out the proposed activities well-reasoned, well organized, and based on a sound rationale?

4. Does the plan incorporate a mechanism to assess success?

5. How qualified is the individual, team, or institution to conduct the proposed activities?

6. Are there adequate resources available to the PI (either at the home institution or through collaborations) to carry out the proposed activities?
Key Questions for PIs to Consider When Developing Proposals

- What has already been done?
- What do you intend to do?
- Why is the work important (to more than you) or unique?
- What do you need besides money to carry out the proposed work?
- Do you have the right team? Resources? Realistic need?
- Is NSF the right funding source? Is the respective NSF program the right program?
- Who should you talk to before, during, and after submission?

Five Key Elements

1. Great idea
2. Fit with current research expertise and career development plans
3. Ability to devise a strategy including benchmarks, timelines, and metrics
4. Adequate resources to accomplish your project
5. Assessment Plan

Budgetary Guidelines

Amounts should be:
- Realistic and reasonable
- Well-justified and should establish need
- Consistent with program guidelines in solicitation and Proposal & Award Policies & Procedures Guide (PAPPG)

Eligible costs consist of:
- Personnel
- Equipment
- Travel
- Participant support
- Other (e.g., subs, consultants, computer services, publications costs)
- Indirect costs (as appropriate)
Reviewer Details

- Types of reviewers recruited
  - You!
  - Specific content expertise
  - General or education expertise
  - Balance of racial and gender diversity, geography, career entry, institution types, & grant experience
- Identifying reviewers
- At least 3 external reviews per proposal

Did you know?

- An average of 2,000 proposals are returned without review (RWR) each yr.
- The 4 most common reasons a proposal is RWR include being:
  - Not responsive to PAPPG or solicitation
  - Late
  - Inappropriate for NSF Funding
  - Duplicative or substantially similar submission to a proposal already declined, awarded, or under consideration
Learning to Navigate nsf.gov

- Navigating: Funding at www.NSF.gov
- Navigating: Awards at www.NSF.gov

Receiving NSF Notifications

- Deadlines are 90 days after the announcement is posted to the NSF website.
- To get notifications, go to www.nsf.gov
  - Click on “News” in the top menu panel.
  - Click on the “Get News Updates by Email” link at the top.
  - You can also sign up to get updates from Directorates.

Internal Institutional Processes and Procedures to Consider

- Does your institution have specific guidelines or protocols that must be followed when seeking external funding?
- Who are the key people that must be contacted? How is the SRO/SPO office involved?
- Is there a specific timeline that must be followed?
- Is there coordination between research preparation and IRB approval at your institution?
### TRUE OR FALSE?

1. **NSF has a published document, updated annually, that provides guidance on proposal preparation.**
   - **TRUE:** NSF’s proposal preparation and submission guidelines can be found in the NSF Grant Proposal Guide (NSF 16-1). The GPG provides guidance for the preparation and submission of proposals to NSF.

2. **NSF has two required merit review criteria for all proposals.**
   - **TRUE:** All NSF proposals are evaluated through use of two National Science Board approved merit review criteria (Intellectual Merit and Broader Impacts). In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities. The two merit review criteria are listed in Chapter III.A of the GPG. The criteria include considerations that help define them. These considerations are suggestions, and not all will apply to any given proposal.

3. **Published solicitations are the only mechanisms NSF uses to generate proposals.**
   - **FALSE:** NSF utilizes a variety of mechanisms to generate proposals. There are four categories of funding opportunities: Dear Colleague Letters, Program Descriptions, Program Announcements and Program Solicitations. For a description of each category and further information, consult the GPG Chapter I.C.

4. **It is permissible to include appendices in the NSF proposal submission.**
   - **FALSE:** All information necessary for the review of a proposal should be contained in Sections A through I of the proposal. Appendices may not be included unless a deviation has been authorized. GPG Chapter II.A contains information on deviations.
5. A proposer can submit the same proposal to different directorates or divisions within NSF for simultaneous review.
   - **FALSE:** Only one submission should be provided to NSF even if review by multiple programs is envisioned. See GPG Chapter IV.B for the NSF return policy.

6. A proposer can apply for NSF funding to conduct a conference, symposia or workshop without a solicited request for such proposals.
   - **TRUE:** NSF supports conferences, symposia and workshops in special areas of science and engineering that bring experts together to discuss recent research or education findings or to expose other researchers or students to new research and education techniques. Requests generally should be made at least a year in advance of the scheduled date. See GPG Chapter II. D.7 for more information.

7. As PI for an NSF grant, I am considered to be the awardee or grantee.
   - **FALSE:** The institution to whom the award is made is considered to be the grantee/awardee. If the PI leaves the institution, the grant does not automatically follow the PI.

8. A proposer that is not a U.S. citizen cannot apply for an NSF grant?
   - **FALSE:** Except for NSF fellowships, which by statute can be made only to citizens, nationals, or lawfully admitted permanent resident aliens of the United States, there generally are no nationality restrictions for PIs/co-PIs in any NSF program. A proposing institution in the US may designate as Principal Investigator anyone it believes to be capable of fulfilling the role.

9. A proposer can resubmit a previously declined proposal to NSF, without any changes.
   - **FALSE:** A declined proposal may be resubmitted, but only after it has undergone substantial revision(s). The submission of duplicate or substantially similar proposals for review without prior NSF approval may result in the return of the redundant proposals. Resubmittals that have not clearly taken into account the major comments or concerns resulting from the prior NSF review may be returned without review. See GPG Chapter IV, Section B, Return Without Review, for further information.
10. Collaborative proposals from multiple institutions may be submitted to fund 1 project.
   - TRUE: A collaborative proposal is one in which investigators from two or more organizations wish to collaborate on a unified research project. Collaborative proposals may be submitted to NSF in one of two methods: as a single proposal, in which a single award is being requested (with subawards administered by the lead organization); or by simultaneous submission of proposals from separate institutions, with each organization requesting a separate award. See Chapter II.D.3 of the GPG for additional information.

11. A proposer is not required to use FastLane to prepare and submit proposals to NSF.
   - TRUE: Proposers may opt to submit proposals electronically either via Grants.gov or via the NSF FastLane system. Grants.gov provides a single Government-wide portal for finding and applying for Federal grants online. All collaborative proposals submitted as separate submissions from multiple organizations must be submitted via the NSF FastLane system. For proposers who cannot submit electronically, an authorization to deviate from the electronic submission requirements must be approved in advance of submission of the paper proposal in accordance with GPG Chapter II.A.

Helpful Hints

The submitter’s three jobs:

- Identify the right funding opportunity
- Conceptualize a fantastic project
- Write a persuasive proposal in 15 pages
Possible Timeline for Proposals

- 6 - 12 MONTHS AHEAD: identify opportunities from prior years, read award abstracts and outcome reports
- 6 MONTHS AHEAD: begin discussing with any partners
- 3 MONTHS AHEAD: read final solicitation carefully. Alert sponsored projects office
- 1.5 MONTHS AHEAD: share draft proposal for feedback with colleagues. First draft of budgets
- 2 WEEKS AHEAD: upload everything except narrative, if possible; ensure subcontract paperwork done
- 1 WEEK AHEAD: final edits by PI, partners, and sponsored projects; mop up any last supporting docs
- DAY BEFORE DUE DATE: submit if possible

What Makes a Proposal Competitive?

1. Original ideas
2. Succinct, focused project plan
3. Realistic amount of work
4. Sufficient detail provided
5. Cost effective but high impact
6. Knowledge and experience of PIs
7. Contribution to the field
8. Rationale and evidence of potential effectiveness
9. Likelihood the project will be sustained
10. Prepare a solid evaluation plan

PROPOSAL WRITING

Helpful Hints & Fatal Flaws
1. Read the Program Announcement
   - NSF has no hidden agendas. It’s all there in the program announcement.
   - Talk with a program officer to make sure that your ideas fit in the program. If the program officer tells you that your ideas are too narrow or don’t fit a program, look for other sources.
   - Make sure that your project is worthwhile, realistic, well-planned, and innovative.

2. Work on Projects You Care Deeply About
   - Let your commitment come through in the proposal.
   - Make sure reviewers can understand the importance of this work to your institution and to others.
   - Caveat: But don’t become such a one “song” person that you can’t listen to others.
HELPFUL HINTS for proposal writing

3  Build on What Others Have Done
  • Like any research project, you must build on what others have done before you and then add to the base of knowledge. Don’t reinvent the wheel.
  • Read the literature, go to workshops, talk with others.
  • Be current.
  • Discuss the value added of your project. What are you adding to the knowledge base?

HELPFUL HINTS for proposal writing

4  Think Global, Act Local and Global
  • Your project must have more than just a local impact. It must impact more than just your students and your institution. How can others use and build on your work?
  • But, we really do want you to be a “prophet in your own land.” If the project is not good enough for you and your institution to use, why should others?

HELPFUL HINTS for proposal writing

5  Have Measurable Goals and Objectives
  • Enhancing student learning, improving undergraduate education, and other similar things are lofty, but not measurable. Make sure that you have measurable goals and objectives. What will be delivered? What is needed to convince others that this works and is worth supporting or emulating?
Think Teamwork

- Successful projects are team efforts, although individuals matter too. Your project team should be greater than the sum of the parts.
- You work in a department. Department efforts are more likely to be successful than 1 person efforts.
- You must have support of administrators. Keep them involved, make them look good, give them credit, find out what they need to support you.
- Get a good group of internal and external advisors and an outside evaluator (or evaluation team).

Use Good Management Skills

- Have a realistic time line and implementation schedule from the beginning and stick to it.
- Have milestones and specific deliverables (with dates)
- Use carrots when you can (but be prepared to use the baton when you must). Don’t reward until people deliver.
- Assign responsibilities, but also give folks needed authority to do them, and then hold them accountable.

Evaluation is Impact and Effectiveness

- You do need numbers. How many students are impacted? How many faculty? How many students succeed in the next course?
- You need evidence that your project is having an impact and that it is effective. How do you know the project is working and that it is worthwhile?
- Ask who needs to be convinced and what evidence will they accept.
- You cannot evaluate yourself. You have to have outside validation.
- Build in evaluation from the beginning.
9 Spread the Word
- Work with other faculty and support them as they try to implement your materials. Doing new things is not easy.
- Try to get a team of folks who have used your materials to help spread the word.
- Work with not only faculty in your discipline, but reach out to other disciplines.
- Have a proactive dissemination plan. A website is necessary, but not sufficient.

10 Pay Back Time
- Keep NSF or your funder informed. They have to report too. It’s all a cycle.
  - Send in reports on time. Use the required format.
  - Send in “highlights”, information about awards, student impact, pictures, etc.
- Give credit to NSF or other funders, your administrators, your team members, your department, etc. Giving credit to others makes you look better and get you better support later.
- Offer to be a reviewer and to help others.
10 WAYS TO WRITE A GOOD PROPOSAL That Won’t Get Funded

1 Assume deadlines are not enforced

Instead...

• Work early with your Sponsored Research Officer (SRO).
• Test drive FastLane and make sure your SRO knows how to drive too!
• Set your own final deadline a day or so ahead of the formal deadline to allow time to solve problems.

2 Assume page limits and font size restrictions are not enforced

Instead...

• Consult the program solicitation and the GPG (Grant Proposal Guide) carefully.
• Proposals that exceed page and/or font size limits are returned without review.

3 Substitute flowery rhetoric for good examples

Instead...

• Minimize complaints about students, other departments, the administration, etc., and describe what you will do and why.
• Ground your project in the context of related efforts.
• Provide detailed examples of learning materials, if relevant.
• Specify who you will work with and why.
• State how you plan to assess progress and student learning.
• Detail the tasks and timeline for completing activities.
• Specifically address intellectual merit and broader impacts and use the phrases explicitly in the project summary.
4. Don’t check your *spelling*, nor your *grammar*

Instead...
- Check and double check; first impressions are important to reviewers.
- State your good ideas clearly, ignore the bad ones.
- Have a trusted colleague who is not involved in the project read your drafts and final proposal.

**Note:** Don’t use complimentary when you mean complementary or principle investigator when you mean principal investigator, etc.

5. Assume the program guidelines have not changed; or better yet, ignore them!

Instead...
- Read the current solicitation completely and carefully.
- Address each area outlined in the solicitation that is relevant to your project.
- Check the program solicitation carefully for any additional criteria, e.g. the Integration of Research and Education, or integrating diversity into NSF Programs, Projects, and Activities

6. Assert: “Evaluation will be ongoing and consist of a variety of methods”

Instead...
- Plan for formative and summative evaluation.
- Include an evaluation plan with specific timelines and projected benchmarks.
- Engage an objective evaluator.
7. Assume a project website is sufficient for dissemination
   Instead...
   • A website may be necessary, but who will maintain it and how in the long run?
   • Engage beta test sites. “Early adopters” can serve as natural dissemination channels.
   • Plan workshops and mini-courses; identify similar projects and propose sessions at regional and national meetings.
   • Learn about and use NSDL and other digital repositories.

8. Assume your past accomplishments are well known; after all NSF may have funded them
   Instead...
   • Provide results from prior funding – this includes quantitative data and information on impact.
   • Describe how new efforts build on this previous work, and how it has contributed to the broader knowledge base about educational improvement.
   • Recognize that the review panelists are diverse and not all familiar with your institutional context.

9. Provide a template letter of commitment for your (genuine) supporters to use. (They will!)
   Instead...
   • Ask for original letters of support that detail what your collaborators will do and why involvement in your project will help them.
   • Letters from administrators are stronger if they demonstrate real commitment, e.g. release time, faculty development funds, new course approvals, etc.
WAYS TO WRITE A GOOD PROPOSAL That Won't Get Funded

10 – Inflate the budget to allow for negotiations

–Instead...
  • Make the budget reflect the work plan directly.
  • Provide a budget explanation that ties your budget request to project personnel and activities.
  • Make it clear who is responsible for what.
  • Provide biographical sketches for all key personnel.

CONVERSATION?

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