Writing an Effective Proposal

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Workshop Agenda

- Enhancement strategies
  - General aspects
  - Goals, objectives, and outcomes
  - Rationale
  - Realities of the review process

Workshop Outcomes

After the workshop, you should be able to:

- Identify areas where proposals can be enhanced
  - Made more competitive
- Generate a list of suggestions for each area

CCLI Program

Vision:

- Excellent STEM education for all undergraduate students.

Goal:

- Stimulate, disseminate, and institutionalize innovative developments in STEM education through the production of knowledge and the improvement of practice.

Turning a Good Idea into a Competitive Proposal

Scenario: Origin of a CCLI Proposal

- *Prof X has taught* Signal Processing *at U of Y for several semesters.*
- *She has an idea for* greatly improving *the course by adding "new stuff"*
  - *"New stuff"*
    - *Material (e. g., modules, web-based instruction)*
    - *Activities (e. g., laboratories, projects)*
    - *Pedagogy (e. g., problem based learning)*
- *She has done some preliminary evaluation*
- *She decides to prepare a CCLI proposal*

Scenario: Professor X's Initial Proposal Outline

- ***Goals:*** **Develop "*new stuff*" to enhance student learning at U of Y**
- ***Rationale:*** **Observed shortcomings in educational experience of the students at U of Y and felt that *new stuff* would improve the situation**
- ***Project Description:*** **Details of "*new stuff*"**
- ***Evaluation:*** **Use U of Y's course evaluation forms to show difference**
- ***Dissemination:*** **Describe "*new stuff*" using conference papers, journal articles, and web site**

Exercise

As a colleague, provide a few suggestions to guide Prof. X as she develops her proposal for the CCLI program

PD's response to Proposal Strategies

- **Read the program solicitation**
  - **Determine how your ideas match the solicitation and how you can improve the match**
- **Articulate goals, objectives, & outcomes**
  - **Outcomes should include improved student learning**
- **Build on existing knowledge base**
  - **Review the literature**
  - **Present evidence that the "new stuff" is doable; will enhance learning; is the best approach**
- **Explore potential collaborations**

PD's response to Proposal Strategies

- **Use data to document existing shortcomings in student learning**
- **Describe management plan**
  - **Provide tasks, team responsibilities, timeline**
- **Provide clear examples of the approach**
- **Integrate the evaluation effort early**
  - **Build assessment tools around defined objectives and expected outcomes**
  - **Connect with independent evaluation experts**

PD's response to Proposal Strategies

- **Identify strategies for dissemination**
  - **Define a plan to contribute to knowledge base**
  - **Address broader impacts**
  - **Collaborate, form partnerships (build community)**

Write Proposal to Answer Reviewers' Questions

What are you trying to accomplish?
What will be the outcomes? } ***Goals etc.***

Why do you believe that you have a good idea?
Why is the problem important?
Why is your approach promising? } ***Rationale***

How will you manage the project to ensure success?
How will you know if you succeed? } ***Evaluation***

How will others find out about your work?
How will you interest them?
How will you excite them? } ***Dissemination***

Goals → Objectives → Outcomes

Project Goals and Objectives

Defining Goals

Broad, overarching statement of intention or ambition

Sample Goal for Prof. X

The project is developing a signal-processing laboratory that is vertically integrated into the curriculum to illustrate theoretical concepts through application-driven exercises.

Project Objectives

Defining Objectives

Specific statement of intention

- **Measurable**
- **More focused and specific than a goal**
- **A goal typically leads to several objectives**

Project Objectives

Activity

Think of objectives for this sample project goal

Sample Goal for Prof. X

The project is developing a signal-processing laboratory that is vertically integrated into the curriculum to illustrate theoretical concepts through application-driven exercises.

PD's Response
Sample Objectives

- ***Create laboratory exercises that give hands-on experience to enhance conceptual understanding***
- ***Increase student retention rates (in program) because interest in topic is increased***
- ***Increase retention of technical material for future courses***
- ***Improve laboratory skills of students***
- ***Improve student confidence or attitude about profession***

Expected Measurable Outcomes

Defining Outcomes

Statement of expected result

- **Measurable with criteria for success**
- **An objective may lead to one or more outcomes**

Activity

Think of one or more expected measurable outcomes for this objective:

Increase student retention rates (in program)

PD's Response
Expected Measurable Outcomes

Objective: Increase student retention rates

- *Increase student graduation rates by __ percent*
- *Increase students' transition rates from the first to second year courses from __ to __*
- *Increase the students' "Attitude towards discipline" as measured by surveys and interviews by ___ percent*

Project Rationale

Project Rationale

- Rationale is the narrative that provides the context for the project
  - It's the section that connects the "*Statement of Goals and Outcomes*" to the "*Project Plan*"
- What's the purpose of the rationale?
  - What should it contain?
  - What should it accomplish?
- What should an applicant include in their rationale?
  - What topics should a PI address?

An Effective Rationale

Think of questions that the *Rationale* for a CCLI proposal should answer

(pay particular attention to questions the reviewer will expect answered)

TSRL

PD's Response
An Effective Rationale

- What does the knowledge base say about the approach?
  - What have others done that is related?
  - What has worked previously?
  - What have been the problems/challenges?
- Why is this problem important?
  - Is it a global or local problem?
  - What are the potential broader impacts?
  - How will it improve quality of learning?

PD's Response
An Effective Rationale

- What is the evidence that the approach will solve the problem?
  - Address the defined outcomes?
  - Achieve the defined outcomes?
  - Improve student learning?
- What are alternate approaches?

PD's Response
An Effective Rationale

- What are the potential problems & limitations?
  - What can be done about them?
- Has the applicant done prior work?
  - Has funded work lead to interesting results?
  - Are there any preliminary data and what do they show?

Review Process -- Practical Aspects

Practical Aspects of Review Process

Reviewers have:

- Many proposals
  - Ten or more from several areas
- Limited time for your proposal
  - 20 minutes for first read
- Different experiences in review process
  - Veterans to novices
- Different levels of knowledge in proposal area
  - Experts to outsiders
- Discussions of proposals' merits at panel meeting
  - Share expertise and experience

PD's Response
Review Process

- Use good style (clarity, organization, etc.)
  - Be concise, but complete
  - Write simply but professionally
  - Avoid jargon and acronyms
  - Check grammar and spelling
  - Use sections, heading, short paragraphs, & bullets (Avoid dense, compact text)
- Reinforce your ideas
  - Summarize them; Highlight them (bolding, italics)
- Give examples

PD's Response
Review Process

- Provide appropriate level of detail
- Pay special attention to Project Summary
  - Summarize goals, rationale, methods, and evaluation and dissemination plans
  - Address intellectual merit and broader impacts
    - Explicitly and independently
    - Three paragraphs with headings:
      - "Summary"
      - "Intellectual Merit"
      - "Broader Impacts"

PD's Response
Review Process

- Follow the solicitation and *GPG*
  - Adhere to page, font size, and margin limitations
    - Use allotted space but don't pad the proposal
  - Follow suggested (or implied) organization
  - Use appendices sparingly (check solicitation to see if allowed)
  - Include letters showing commitments from others
    - Avoid form letters

PD's Response Review Process

- Prepare credible budget
  - Consistent with the scope of project
  - Clearly explain and justify each item
- Address prior funding when appropriate
  - Emphasize results
- Sell your ideas but don't over promote
- Proofread the proposal
- "Tell a story" and Turn a good idea into a competitive proposal

Questions and Concerns During Proposal Preparation

- Read the solicitation and the *GPG*
- Get advice from NSF program directors or Experienced colleagues
- Use an "imaginary panel" (Experts, novices, in-field/out)
  - How would they respond to a question?
  - How would they react to an idea?
  - How would they react to a written section?
  - What else would they like to see?
  - What questions will they have?
- Use your judgment

Conclusion

Presentation at:
http://www.nsf.gov/events/

Read the solicitation!
Read the *GPG!*

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