Presentation Outline

I. NSF CAREER program info (overview)

II. Broader Impacts Criterion What does it mean?

III. Developing a CAREER proposal Some tips

IV. Educational Component

V. Crafting the proposal budget

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NSF CAREER Award:
IV. Educational Component

CAREER Award Program

- Excerpts from the Program Solicitation:
  - "NSF established the CAREER program in recognition of the critical roles played by faculty members in **integrating research and education**, and in fostering the natural connections between the processes of learning and discovery."
  - "The CAREER program embodies NSF's commitment to encourage faculty to practice, and academic institutions to value, **integration of research and education**."
  - "This **integration of research and education** requires close collaboration between the CAREER principal investigator and his/her organization throughout the award, laying the groundwork for fostering sustainability of integration efforts for both the PI and the organization."

Educational Plan

- Successful PIs will propose ***creative, integrative, and effective research and education plans,*** developed within the ***context of the mission*, goals and resources of their organization***,
- and which will build a firm foundation for a lifetime of contributions to the ***integration of research and education.***

****UIC Urban Mission, Great Cities Program***

May be directed towards

- K-12 students
- Undergraduates
- Graduate students
- General public

but should be related to the proposed research

Examples

- design innovative courses or curricula
- support teacher preparation and enhancement
- conduct outreach and mentoring
  - to enhance scientific literacy
  - involve underrepresented groups

More examples

- incorporate research activities into undergraduate courses
- link education activities to industrial, international, or cross-disciplinary work
- implement innovative methods for evaluation and assessment
- design new educational materials

Furthermore, educational plan is

- consistent with research and best practices in curriculum, pedagogy, and evaluation
- as creative and innovative as the research plan

Educational Plan

- State goals and objectives of the educational plan
- Criteria for assessing that these goals are met
- Describe how educational activities are **closely integrated with research plan**
- Describe how the impact of the educational activities will be assessed or evaluated

Evaluation of the Education Plan

- *The 2002 User-Friendly Handbook for Project Evaluation* (NSF 02-057).
- http://www.nsf.gov/pubs/2002/nsf02057/nsf02057.pdf

accepted definition of "**evaluation**" for NSF Projects: "Systematic investigation of the worth or merit of an object..."

How NSF Thinks About Evaluation!

- A component that is an integral part of the research and development process
- It is not something that comes at the end of the project
- It is a continuous process that begins during planning
- Evaluation is regularly and iteratively performed during the project and is completed at the end of the project

Example : Faculty Early Career Development

Proposal Content -

A. Project Summary:

- Summarize the integrated education and research activities of the plan

B. Project description:.

- Provide a specific proposal for activities over 5 years that will build a firm foundation for a lifetime of integrated contributions to research and education.

Plan for developing the Project Description :

- The objectives and significance of the research and education activities.
- The relationship of the research to current knowledge in the field.
- An outline of the plan; including evaluation of the educational activities on a yearly basis.
- The relationship of the plan to career goals and objectives.
- A summary of prior research and educational accomplishments.

Broader Impacts : Research-Education Integrated Activities

Criteria: Broader Impacts of the Proposed Activity

1. Does the activity promote discovery, understanding, teaching, training and learning?
2. Does the proposed activity include participants of underrepresented groups?
3. Does it enhance the infrastructure for research and education?
4. Will the results be disseminated broadly to enhance scientific and technological understandings?
5. What are the benefits of the proposed activity to society?

Sample plans for these 5 questions

1. *Advance discovery and understanding while promoting teaching, training and learning*

- Integrate research activities into the teaching of science at all levels
- Involve students
- Participate in recruiting and professional development of teachers
- Develop research based educational materials and databases
- Partner researchers and educators
- Integrate graduate and undergraduate students
- Develop, adapt, or disseminate effective models and pedagogic approaches to teaching

2. Broaden participation of underrepresented groups

- Establish research and education collaborations with students and teachers
- Include students from underrepresented groups
- Make visits and presentations on school campuses
- Mentor emerging scientists and engineers
- Participate in developing new approaches to engage underserved individuals
- Participate in conferences, workshops, and field activities

3. Enhance infrastructure for research and education

- Identify and establish collaborations between disciplines and institutions
- Stimulate and support next generation instrumentation and research and education platforms
- Maintain and modernize shared research and education infrastructure
- Upgrade the computation and computing infrastructure
- Develop activities that ensure multi-user facilities are sites of research and mentoring

4. Broaden dissemination to enhance scientific and technological understanding

- Partner with museums, science centers, and others to develop exhibits for general public
- Involve public and industry in research and education activities
- Give presentations to broader community
- Make data available in a timely manner
- Publish in diverse media
- Present research and education results in formats useful to policy makers
- Participate in multi- and interdisciplinary conferences, workshops, and research activities.
- Integrate research with education activities

5. Benefits to society

- Demonstrate linkage between discovery and societal benefit through application of research and education results.
- Partner with others (e.g., cross-discipline) on projects to integrate research into broader programs
- Analyze, interpret, and synthesize research and education results in formats useful to non-scientists