Proposal Strengths and Weakness as Identified by Reviewers

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Caution

- Most of the information presented in this workshop represents the opinions of individual program officers and is not an official NSF position.

- Use judgment in applying workshops suggestions because NSF requirements and expectations vary among NSF programs.
Overview of Workshops

- **Goal:**
  - Assist you in preparing more competitive proposals

- **Strategy:**
  - Become aware of the most common reviewer-identified strengths and weaknesses
  - Consider approaches for addressing them
CCLI Review Processes

- PD sorts by disciplines
- PD sends to group of reviewers
- Reviewers rate each proposal and submit written reviews
  - Describe the strengths and weaknesses in terms of the intellectual merit and broader impacts criteria
- Panel meets and discuss proposal
- Panel writes a summary of the discussion
  - Highlight strengths and weaknesses
  - Called Panel Summary
Data Collection

- Analyzed the strengths and weaknesses identified in the Panel Summaries
  - CCLI Phase 1 engineering proposals from 2005 and 2006
- Developed codebook of panel summary statements describing strengths and weaknesses
  - Included complementary strength and weakness statements
    - e.g., Proposal was innovative and Proposal was not innovative
  - Identified 30 complementary statements
- Coded the Panel Summaries for 471 proposals
- Identified the top ten coded strengths and weaknesses cited in these proposals
Activity 1

Strengths & Weaknesses Identified by Reviewers

- Pretend you analyzed a stack of panel summaries to identify the most commonly cited strengths and weaknesses
- List what you think will be
  - The four most frequently cited strengths
  - The four most frequently cited weaknesses
- Predict the results of our analysis
Top Five Strengths

4. Topic is important and timely, introducing new material; or it is responsive to industry or a community need

23. PIs were experienced, strong, and technically sound

17. Proposed collaboration with other organizations (diverse 4-year schools, community colleges, K-12, etc.) is detailed and believable

18. Proposal has good potential for involving minorities or women

16. Dissemination plan is excellent and will contribute to STEM education knowledge base.
Second Five Strengths

3. Proposed ideas are likely to have a large impact (Number of students, broadness of idea, etc.)
7. Proposed ideas build on prior work or existing products
13. Evaluation plan is excellent, outstanding, or good
2. Proposed ideas are novel or innovative
10. Proposed activities include non-traditional pedagogy.
Top Five Weaknesses

9. Proposed activities are described in insufficient detail or without clear plans.
13. Evaluation plan is weak, incomplete, or lacking
8. Proposed activities are not doable and will not result in expected outcomes.
16. Dissemination plan is weak, incomplete, or lacking or project will not contribute to STEM education knowledge base.
18. Proposal has limited or no real potential for involving minorities or women
Second Five Weaknesses

7. Proposed ideas do not build on prior work or existing products
2. Proposed ideas are not novel or innovative
3. Proposed ideas are not likely to have a large impact (Number of students, broadness of idea, etc.)
17. Proposed collaboration with other organizations (diverse 4-year schools, community colleges, K-12, etc.) is not detailed or believable
4. Topic is not important or timely, does not introduce new material; or is not responsive to industry or a community need
# Top Ten Strengths and Weaknesses

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<tr>
<th>Rank</th>
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<th>Weaknesses</th>
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<tbody>
<tr>
<td>1</td>
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<td><strong>Sufficient detail and clear plans</strong></td>
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<td>2</td>
<td><strong>PI's strong</strong></td>
<td><strong>Evaluation plan good</strong></td>
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Activity 2

Strengths and Weaknesses in Proposal

- Indicate the section of the proposal addressing each strength and weakness

- Consider this outline:
  - Goals & expected measurable outcomes (G)
  - Rationale, introduction, background (R)
  - Methods (M)
  - Implementation, evaluation, dissemination, management plans (P)
## Proposal Section Addressing Strength and Weaknesses

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# Proposal Section Addressing Strength and Weaknesses – Our Answers

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Activity 3

Strengthening the Rationale

- Indicate the topics that should be addressed in the rationale to address the common strengths and weaknesses?
An Effective Rationale

- An effective rationale discusses
  - The importance of the problem (industry needs, emerging area)
  - The potential impact of the work (large number of students, global)
  - Prior work by others (referenced to the knowledge base)
  - Prior work by applicant (preliminary data)
  - Evidence or theoretical basis indicating that the approach will solve the problem (referenced to the knowledge base)
  - Potential problems, limitations, alternate approaches
  - Potential Contributions to teaching and learning knowledge base

- Don’t limit to Intellectual merit -- also include broader impacts
Purpose of Rationale

- The rationale should convince the reader that the applicant
  - Has identified an important, big-impact problem
  - Understands the problem and the prior work
  - Has an innovative approach for addressing the problem
  - Has thought about the broader impacts in general and broadening participation in particular
Activity 4

Strengthening the Evaluation Plan

- Indicate some topics that should be included in an effective evaluation plan
PD’s Response

Evaluation Plan

- Name & qualifications of the evaluation expert
- Goals and outcomes and evaluation questions
- Tools & protocols for evaluating each outcome
- Analysis & interpretation procedures
- Confounding factors & approaches for minimizing their impact
- Formative evaluation techniques for monitoring and improving the project as it evolves
- Summative evaluation techniques for characterizing the accomplishments of the completed project.
Purpose of Evaluation Plan

- The evaluation plan should convince the reader that the applicant
  - Has clear measurable expected outcomes
  - Will collect, analyze, and interpret appropriate data
  - Will complete an informative evaluation both for monitoring (formative) and for validating (summative)
Activity 5

Strengthening the Dissemination Plan

- Indicate some components of a strong dissemination plan
PD’s Response
Dissemination Plan

- Include specifics in description of publication efforts
  - Conference or journal, budget, tentative title, purpose
- Put material in a form suitable for NSDL
- Explore other venues
  - Specialty websites and list servers, CUR, PKAL
- Target and involve a specific sub-population
  - Integrate community building, dissemination, and evaluation
- Explore commercialization
- Explore beta test sites
Purpose of Dissemination Plan

- The dissemination plan should convince the reader that the applicant
  - Will have something to disseminate
  - Has plans to inform and encourage others and to facilitate their use of your innovation
Panel Summaries specifically noted the involvement of women and minorities as a strength or weakness

NOTE: Broadening participation is only one component of the broader impacts
Activity 6

Strengthening Broadening Participation

- Indicate approaches for strengthening the discussion on broadening participation
PD’s Response

Broadening Participation

- Define expected outcomes
- Present rational for expectation
- Describe prior work by you and others
- Describe helpful existing relationships
- Describe strategy and activities
- Plan to evaluate outcomes
- Make consistent with rest of project
Purpose of the Discussion on Broadening Participation

- The dissemination plan should convince the reader that the applicant
  - Is serious about the effort to broaden participation
  - Has a strategy for achieving it
  - Has a rationale supporting the strategy
Activity 7

Lessons Learned

- What are the two most surprising ideas you encountered in the session?
Questions