

Proposal Strengths and Weakness as Identified by Reviewers

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**FIE Conference
Oct 13, 2007**

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 proposal**

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

Rank	Strengths	Weaknesses
1	Important, timely topics & responsive to needs	<i>Sufficient detail and clear plans</i>
2	<i>PI's strong</i>	<i>Evaluation plan good</i>
3	Collaboration details	<i>Activities doable & related to outcomes</i>
4	Potential for involving women and minorities	Dissemination good & contributes to knowledge
5	Dissemination good & contributes to knowledge base	Potential for involving women and minorities
6	Large impact	Build on prior work or products
7	Build on prior work or products	Innovative or novel
8	Evaluation plan good	Large impact
9	Innovative or novel	Collaboration details
10	<i>Non-traditional pedagogy</i>	Important, timely topics & responsive to needs

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

Proposal Section	Strengths & Weaknesses
	Activities doable & related to outcomes
	Build on prior work or products
	Collaboration details
	Dissemination good & contributes to KB
	Evaluation plan good
	Important, timely topics & responsive to needs
	Innovative or novel
	Large impact
	Non-traditional pedagogy
	PI's strong
	Potential for involving women and minorities
	Sufficient detail and clear plans

Proposal Section Addressing Strength and Weaknesses – Our Answers

Proposal Section	Strengths & Weaknesses
M	Activities doable & related to outcomes
R	Build on prior work or products
P	Collaboration details
P	Dissemination good & contributes to KB
P	Evaluation plan good
R	Important, timely topics & responsive to needs
R	Innovative or novel
R	Large impact
M	Non-traditional pedagogy
P	PI's strong
R M P	Potential for involving W&M
M P	Sufficient detail and clear plans

Activity 3

Strengthening the Rationale

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

PD's Response

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**

Broadening Participation and Broader Impacts

- **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 rationale 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?**

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Questions