Broadening Participation: A Model for Developing the Next Generation of Principal Investigators

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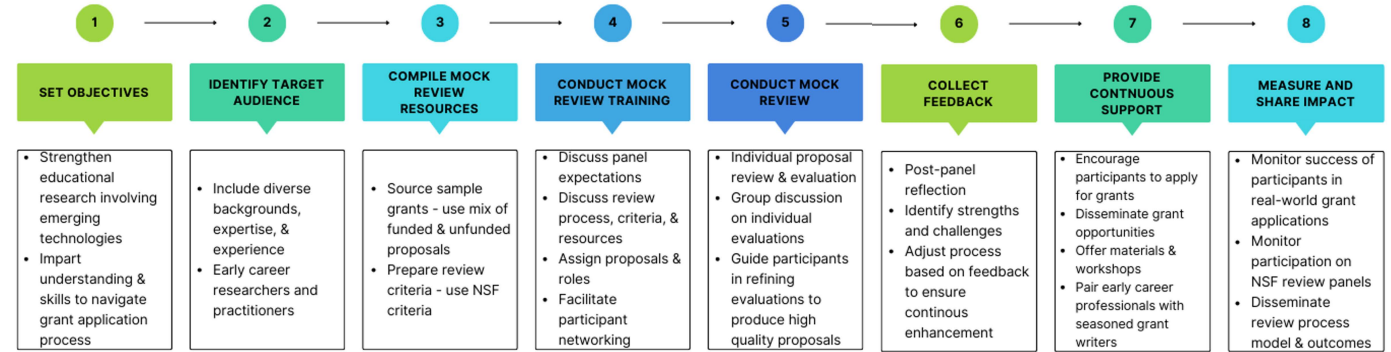
INTRODUCTION

In response to a need to build capacity and representation in education research involving emerging technology, we present a model through which groups of practitioners and early career researchers acquired firsthand experience with reading, reviewing, and evaluating grants aligned with National Science Foundation's review criteria. This model of holding a mock review panel consists of a set of protocols that may be easily replicated to equip and diversify the pool of the next generation of principal investigators. The protocols structures dialogue to calibrate the community around evaluating sample proposals based on their intellectual merit and broader impacts. The elements of the mock review process are outlined in this poster. Through focused efforts to demystify the grant application process for early career researchers and practitioners, it is possible to expand the diversity of research teams and thereby impact the who is doing research, the types of methodologies employed, and the range of topics of studies being proposed in the field.

CONTEXT AND FRAMEWORK

The **Center for Integrative Research in Computing and Learning Sciences** (CIRCLS) is a community-based hub for NSF-funded researchers who explore and investigate technologies that will be available to learners in 5-10 years. With an equity-based approach to broaden participation in research, CIRCLS sponsors a mock review process that (1) provides professional development for emerging and early career scholars about the panel review process and good proposal criteria; (2) facilitates networking among panel participants; and (3) invites new people into the community who have not been represented as a funded PIs previously.

MOCK REVIEW PROCESS

1 SET OBJECTIVES	2 IDENTIFY TARGET AUDIENCE	3 COMPILE MOCK REVIEW RESOURCES	4 CONDUCT MOCK REVIEW TRAINING	5 CONDUCT MOCK REVIEW	6 COLLECT FEEDBACK	7 PROVIDE CONTINUOUS SUPPORT	8 MEASURE AND SHARE IMPACT
• Strengthen educational research involving emerging technologies • Impart understanding & skills to navigate grant application process	• Include diverse backgrounds, expertise, & experience • Early career researchers and practitioners	• Source sample grants - use mix of funded & unfunded proposals • Prepare review criteria - use NSF criteria	• Discuss panel expectations • Discuss review process, criteria, & resources • Assign proposals & roles • Facilitate participant networking	• Individual proposal review & evaluation • Group discussion on individual evaluations • Guide participants in refining evaluations to produce high quality proposals	• Post-panel reflection • Identify strengths and challenges • Adjust process based on feedback to ensure continous enhancement	• Encourage participants to apply for grants • Disseminate grant opportunities • Offer materials & workshops • Pair early career professionals with seasoned grant writers	• Monitor success of participants in real-world grant applications • Monitor participation on NSF review panels • Disseminate review process model & outcomes

ESSENTIAL ELEMENTS OF MOCK REVIEW PANEL

- Establish community norms for a respectful panel
- Assign lead/scribe for each proposal review
- Reviewers read proposals and write reviews prior to panel convening
- Each reviewer completes the proposal review worksheet
- Lead/scribe summarizes proposal
- Each reviewer provides proposal strengths and weaknesses beginning with then scribe
- Lead/scribe takes notes on the discussion
- Assign each proposal a rating
- Assign each proposal a funding category
- Lead/scribe writes summary of discussion

IMPACT

The mock review panel protocol has the potential to broaden participation of the research community by disrupting the cycle of who gets selected as proposal writers and redefining 'who gets to do research.' This process provides a window into the process and review criteria for high-quality proposals, a 'seat at the table' for groups of diverse individuals to share ideas and perspectives, and a mirror so that a new generation of researchers and practitioners have way to view themselves as principal investigators. Revealing the inner workings of a panel in this way is a non-threatening, highly engaging, and participatory approach to inspiring future researchers.

RESOURCE

https://bit.ly/circls23_mock_panels

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Demystifying NSF RITEL Research Proposals: A User-Friendly Rubric with DEI Emphasis

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Introduction

Drafting a grant proposal for submission to the National Science Foundation (NSF) is a complex undertaking that requires careful consideration of multiple areas and attention to detail to improve the chances of being funded. While novice researchers may undertake the writing of the proposal with guidance and mentorship from NSF RITEL program directors, they may not have access to the received wisdom of more experienced researchers to improve their documents. Various institutions have generated publications directed at researchers intending submissions to the NSF and shared guidelines as well as useful suggestions on the grant writing process. While useful, the narrative format utilized does not lend itself to easy consultation as a self-assessment tool. Finally, the topics of Diversity, Inclusion, and Equity are not addressed in detail.

Methods

Phase 1: A rubric was generated that included required NSF guidelines for *key components* of the Research on Innovative Technologies for Enhanced Learning (RITEL) Program Solicitation document (NSF 23-624). In addition, for each key component, a list of suggestions and best practices was generated through group discussion, consultation with secondary sources, and interviews with experienced grant writers. The first draft of this rubric is shared during this meeting.

Phase 2: The RITEL Self-Evaluation Rubric will be shared with a larger pool of experienced researchers to seek their feedback on the recommendations included for selected key components. Submitted comments will be evaluated by the team to yield a user-friendly, structured rubric that will serve as a tool with two main goals: first, to prompt grant writers to address the most critical NSF guidelines and second, to consider other recommendations and best practices that may improve their proposal document.

Results

The rubric included useful recommendations and reminders to experienced and novice grant writers alike. It was found to be unique in the addition of a section on Diversity, Equity, and Inclusion (DEI) which encouraged researchers to reflect on their rationale for including diverse, underrepresented groups and protected classes as study populations, strategies for their recruitment, and potential for generalization of results.

Conclusion

Additional use of the rubric to evaluate anonymized manuscripts to compare the results to the actual funding decisions would improve the usefulness and validity of the instrument.

Summary RITEL Heuristics

Idea/Intellectual Merit Adheres to NSF guidelines:
Early stage & exploratory research that advances technology & advances education/learning.

Collaboration between Teaching/ Learning and Technology Areas Adheres to NSF guidelines:
Artificial intelligence (AI), Robotics, Immersive or augmenting technologies, diverse learner/ educator populations, contexts, and content, including teaching and learning in (STEM) and in foundational areas that enable STEM (e.g., self-regulation, literacy, communication, collaboration, creativity, & socio-emotional skills.

Broader Impacts Adhere to NSF guidelines:
Proposal states benefits to society or how project will advance desired societal outcomes through creative, original, or potentially transformative concepts. Plan is well-reasoned and well-organized.

Project Summary Page Adheres to NSF guidelines
The summary includes a "self-contained description of the activity that would result if the proposal were funded." Clearly states the why or motivation behind the project. Provides a summary of the Broader Impact.

Proposal Adheres to NSF guidelines (per PAPPG):
Project Summary, Project Description (Intellectual Merit and Broader Impacts), References, Budget and Budget Justification, Facilities, Equipment and Other Resources, Senior Personnel Documents.

PI and Collaborators in the Research Team Adheres to NSF guidelines:
The proposal reflects the qualifications of the team. Teams should include individuals from multiple disciplines with strong backgrounds in education/learning and technology.

Dissemination of Results Adheres to NSF guidelines:
Proposal details how the results will be disseminated broadly and how PII will be protected.

Timeline Adheres to NSF's guidelines: Proposed timeline appears reasonable to complete project activities.

Facilities, Equipment and Other Resources Adheres to NSF guidelines:
Description of organizational resources available at the PI home institution and/or collaborator institutions.

Diversity, Equity, and Inclusion Elements Align with NSF RITEL's Stated DEI Priorities
Serve diverse learner/educator populations,developing new educational technologies that are cost-effective for budget-limited school districts, colleges and universities. Collaborate with diverse cross-disciplinary teams.

Planned approaches to Measuring Outcomes
Clear standards for measuring success. Outcomes are clearly stated and measurable. The plan incorporates a mechanism to assess success considering how the project's impact relates to the resources provided.

Project Budget Adheres to NSF Guidelines
Separate budget for each year of proposed funding; budget justification 5 pages or less; budget includes necessary travel, participant costs (if applicable), and administrative costs, classified as indirect costs.

BioSketch Adheres to NSF Guidelines: Create using SciENcv for the preparation of Biosketch.

Access the Rubric & Summary

Check out our complete rubric.

Tell us what you think.

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Acknowledgements

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