QEM Workshop Focusing on Education Research Proposals for the National Science Foundation

Claudia Rankins, Ph.D.
Program Director, HBCU-UP, CAREER

Note: This is not an official NSF document – all opinions expressed here are of the Program Director alone and do not represent NSF policy
About the National Science Foundation

• NSF is the only federal agency whose mission includes support for all fields of fundamental science and engineering, except for medical sciences.
• NSF ensures that research is fully integrated with education so that today's revolutionary work will also be training tomorrow's top scientists and engineers.
• Proposals are submitted to more than 300 programs across NSF.
• Each year NSF receives more than 42,000 proposals and makes about 11,000 awards.
Broadening Participation Research (BPR) Projects

The Broadening Participation Research (BPR) in STEM Education track in the HBCU-UP program provides support for research projects that seek to create and study new theory-driven models and innovations related to the participation and success of underrepresented groups in STEM undergraduate education. Broadening Participation Research proposals in STEM Education may investigate behavioral, cognitive, affective, learning and social differences as well as organizational, institutional or systemic processes that may impact participation and success in STEM education.
BPR Projects

Due date: November 27, 2018 and every 4th Tuesday in November annually thereafter. Note that a Letter of Intent is required on September 4th, 2018 and every 1st Tuesday in September annually thereafter.

Max budget: $350,000 for up to 3 years
PI must be faculty at an HBCU
HBCU-UP Program Solicitation and PAPPG

The HBCU-UP program solicitation, NSF 18-522, is available at:


The Proposal and Award Policies and Procedures Guide is available at:


This guide gives you step by step instructions on proposal preparation.
The ECR program of fundamental research in STEM education provides funding in critical research areas that are essential, broad and enduring. EHR seeks proposals that will help synthesize, build and/or expand research foundations in the following focal areas: STEM learning, STEM learning environments, STEM workforce development, and broadening participation in STEM.

The ECR program is distinguished by its emphasis on the accumulation of robust evidence to inform efforts to (a) understand, (b) build theory to explain, and (c) suggest interventions (and innovations) to address persistent challenges in STEM interest, education, learning, and participation.
Three levels of funding and durations are available to support these investigations. The three levels of funding should align with the maturity of the proposed work, the size and scope of the empirical effort, as well as the capacity of the interdisciplinary team to conduct the proposed research:

(1) **Level I proposals**: have a maximum award size of $500,000 and a maximum duration of 3 years;

(2) **Level II proposals** have a maximum total award size of $1,500,000 and a maximum duration of 3 years;

(3) **Level III proposals** have a maximum award size of $2,500,000 and a maximum duration of 5 years.
Education Core Research ECR

The ECR solicitation can be found at:

Deadline : Second Tuesday in September
CAREER

CAREER is a Foundation-wide activity that offers the National Science Foundation’s most prestigious awards in support of early-career faculty who have the potential to serve as academic role models in research and education, and to lead advances in the missions of their departments or organizations.
CAREER is NSF-Wide

• The program started in 1996
• All Directorates/Offices participate
• Proposals are submitted to program of interest
• More than 9,000 CAREER awards have been made over the years
• NSF Presidential Early-Career Awards in Science and Engineering (PECASE) are selected out of the pool of recent CAREER awardees
EHR CAREER Proposals

CAREER proposals submitted to EHR are expected to formulate research questions that are likely to yield significant knowledge relevant to core problems of STEM education. To support this goal, the proposed research methods should be detailed and carefully justified.
EHR Programs that Accept CAREER Proposals

Division of Graduate Education

• EHR Core Research (ECR)

Division of Research on Learning in Formal and Informal Settings

• Advancing Informal STEM Learning (AISL)
• Discovery Research K-12 (DRK-12)
• EHR Core Research (ECR)
• Innovative Technology Experiences for Students and Teachers (ITEST)
• STEM + Computing Partnerships (STEM +C)
EHR Programs that Accept CAREER Proposals

Division of Undergraduate Education

• EHR Core Research (ECR)
• Improving Undergraduate STEM Education (IUSE)
• Robert Noyce Teacher Scholarship Program (Track 4)

Division of Human Resources Development

• EHR Core Research (ECR)
• Historically Black Colleges and Universities Undergraduate Program
• Louis Stokes Alliances for Minority Participation
• Tribal Colleges and Universities Program
CAREER PI Eligibility Criteria

- Hold a doctoral degree in a field supported by NSF by EHR’s deadline for submission of CAREER proposals (July 18, 2018; and July 17, 2019);
- Be engaged in research and education in a field supported by NSF;
- Be employed in a tenure-track (or tenure-track-equivalent) position as an assistant professor (or equivalent title) as of October 1 after the proposal submission;
- Be untenured as of October 1 following the proposal submission; and
- Have not previously received a CAREER award. (Prior or concurrent Federal support for other types of awards for non-duplicative research does not preclude eligibility.)
The solicitation 17-537 can be found at:

Deadlines for CAREER are in mid-July and vary by directorate.
What Makes a Successful ER* Proposal

- Investigators should pose research problems of compelling importance deeply rooted in one or more STEM fields. Proposed research methods must closely align with clear, specific research questions.

- Investigators must demonstrate how the proposed research plan builds upon existing theory and evidence from relevant fields. Proposals must draw broadly on the current education-relevant literatures and also on the specific literature in any STEM domain of central focus.

- * ER education research
What Makes a Successful ER Proposal

- Investigators must explicitly describe the research design, including underlying methodological assumptions, targeted population and sampling, measures and instruments, and data gathering and analysis plan. Data collection procedures should be well specified, particularly with information on the reliability, validity, and appropriateness of proposed measures and instruments or particular plans for establishing them if not initially known.

- Reporting pilot results and providing examples of anticipated findings that might result from the proposed studies will strengthen the competitiveness of proposals.
What Makes a Successful ER Proposal

• Proposals involving quantitative research should include: descriptions of the statistical methods to be used; details on how potential threats to internal and external validity will be addressed; results of power analyses demonstrating the adequacy of proposed sample sizes; and estimates of effect sizes, as appropriate.

• Proposals involving qualitative research should explain the procedures that would be used to collect, code, reduce, and analyze data, and describe the specific conceptual frameworks that will guide analyses.
What Makes a Successful Proposal

The *Common Guidelines for Education Research and Development* (NSF 13-126), jointly developed by the National Science Foundation and the Institute of Education Sciences in the U.S. Department of Education, are a useful reference to help in the preparation of education research proposals for submission to EHR.

**Evaluation and Advisory Boards**

- **Evaluation/Assessment:** One of the elements to be considered in the review of both the intellectual merit and broader impacts of proposals is the mechanism to evaluate success. Meaningful assessment and evaluation of NSF-funded projects should be based on appropriate metrics. Thus, education research projects submitted to EHR should include clearly stated goals, specific descriptions of the activities that the PI intends to do, and a plan in place to document the outputs of those activities.

- **Advisory Boards:** Education research proposals submitted to EHR may include advisory boards, including experts from the fields represented in the proposals to ensure appropriate advice, oversight, direction of the proposed scopes of work, and evaluation/assessment of the impact of the research and education activities.
Concerns Noted by Reviewers

- Lack of adequate justification for the proposed project.
- Lack of clear goals and objectives.
- Lack of references, outdated references, references do not link to what is proposed.
- Lack of theoretical framework, outdated framework, framework that doesn’t apply.
- Lack of clarity or detail in the methodology and/or data analysis.
- Lack of justification for sample size or lack of information on how study participants will be selected.
Concerns Noted by Reviewers

• There was no assessment plan.
• Dissemination plan was generic and vague.
• Underdeveloped data management plan.
• If students are in budget, no discussion on how students will be engaged or impact on students.
• Proposal was not proof read – typos, font issues, illegible tables or charts.
• Intellectual Merit and Broader Impacts statement in project description was duplicate of that on the summary page or was missing altogether in project description.
Concerns Noted by Reviewers

• Prior support was not addressed in terms of IM and BI.
• For CAREER – the letter from the department chair did not show sufficient report.
• For CAREER – the integration of research and education was not well articulated.
• Lack of adherence to PAPPG and/or to solicitation guidelines.
General Guidelines

• Keep in mind, ECR funds only basic or fundamental education research, while CAREER and BPR fund both basic and applied research.

• CAREER has eligibility restrictions.

• Not having publications or not having done prior research, will make it very hard to be competitive in ECR.
Merit Review Criteria

Both criteria, Intellectual Merit and Broader Impact, will be given full consideration during the merit review and decision-making process. Each criterion is necessary but neither, by itself, is sufficient. Proposers must fully address both criteria.

The following elements should be considered in the proposal’s review for both criteria:

What is the potential for the proposed activity to
- advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
- benefit society or advance desired societal outcomes (Broader Impacts)?
Merit Review Criteria

• Do the proposed activities suggest and explore creative, original, or potentially transformative concepts?

• Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?

• How well qualified is the individual, team, or institution to conduct the proposed activities?

• Are there adequate resources available to the PI (either at the home institution or through collaborations) to carry out the proposed activities?
Contact Information

Claudia Rankins, Program Director,
(703)-292-8109  crankins@nsf.gov

Earnestine Easter, Program Director,
(703)-292-8112  epsalmon@nsf.gov

Clytrice Watson, Program Director
(703)-292-4775  clwatson@nsf.gov