Discovery Research PreK-12 (DRK-12)

NEW Solicitation 23-596

https://new.nsf.gov/funding/opportunities/discovery-research-prek-12-drk-12

Submission Deadline: **November 8, 2023**

National Science Foundation
Directorate for STEM Education (EDU)

Preparing a diverse STEM workforce and a well-informed citizenry

Overview of this Information Session

1. Describe the DRK-12 Program's Aims & Project Expectations

2. Reminders and Resources

DRK-12 Summer Outreach 2023

Interactive Webinars

- **Thursday, July 20, 1-2PM ET**
  - Merit review criteria, program strands and project types.
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  - Technical support, including budgeting.

PO Office Hours in August, dates TBD

One-page concept papers / project summaries can be submitted any time before October 8 to DRLDRK12@nsf.gov for feedback.

Additional Resources

- NSF Proposal Toolkit, includes key information and resources including a Proposal Development Timeline
- **Evidence Quality and Reach (EQR) Hub** offers learning events, services, and resources related to **research methods; knowledge translation; and diversity, equity, and inclusion**.
- Video podcast by Drs. Ilana Horn and Terrell Morton: Uncovering the Hidden Curriculum of DRK-12: Post Panel Pop-off.

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Important Features of New Solicitation

1. **NEW**: Added Partnership Development project type (up to $100,000 for one year)

   Developing partnerships between researchers and ***preK-12 schools*** is the primary aim; e.g., stakeholder meetings, project planning and explorations regarding the positioning and capacity of partners to work together to advance formal PreK-12 STEM teaching and learning.

2. Emphasized a programmatic commitment to research in the Teaching Strand as STEM workforce development.
3. Emphasized ***dissemination*** plans as one critical component of knowledge mobilization or the reciprocal exchange/translation of knowledge between fields, stakeholders, etc.
4. Moved *Assessment* from a project Strand to a project type.
5. Updated all project type descriptions.

Invitation to Serve as an NSF Reviewer

- Send an email indicating your interest to DRLDRK12@nsf.gov
- Include a 3-5 sentence sketch of your expertise and short CV.

- **Benefits of Reviewing**
  - Service to education (paid service)
  - Understanding of review processes
  - Understanding of specific program requirements
  - Networking

- **Workload**
  - Reading and commenting on 6-8 proposals
  - Providing substantive written reviews
  - Participating in 2-day interactive (virtual or in person) panel

You cannot serve as a reviewer if you are Senior Personnel on a proposal submitted to the current competition.

Mission & Investments

To develop a diverse and well-prepared U.S. STEM workforce and STEM-literate public by supporting excellent research and development in STEM education.

STEM Learning and Learning Environments

Broadening Participation & Institutional Capacity

STEM Professional Workforce Development

How the DRK-12 Program is Unique and Important

DRK-12 is the ***only*** NSF program whose primary purpose is to support applied research and development at the preK-12 level of ***formal education*** in all areas of STEM.

Invite proposals that --

- Address immediate challenges facing preK-12 STEM education and proposals that anticipate radically different structures and functions of preK-12 teaching and learning.
  - *"Demonstrate a well-rounded understanding of the day-to-day work and expertise of educators in formal teaching and learning contexts, the talents and needs of the nation's diverse student population and their communities, and national, state, or district priorities."*

- Advance opportunities for ***all*** preK-12 students and teachers to develop their STEM talent.

DRK-12 Program Goal: **C**atalyze research and development that enhances ***all*** preK-12 teachers' and students' opportunities to engage in high-quality learning experiences related to the sciences, technology, engineering, and mathematics (STEM).

Objectives

(1) build knowledge about how to develop preK-12 students' and teachers' STEM content knowledge, practices, and skills;
(2) support collaborative partnerships among STEM education researchers and STEM education practitioners and school leaders;
(3) build the field of STEM education by supporting knowledge synthesis and the development of novel and robust assessments of teacher and student learning, engagement, and skills.

Outcomes can include promising, evidence-based products and methods that can be used by others to support the success of *all* teachers and *all* students (e.g., curriculum, teaching and research tools, models of collaboration).

DRK-12 Program Structures

Strand

- Teaching
- Learning

Project Type

- Exploratory
- Design & Development
- Impact
- Implementation & Improvement
- Measurement & Assessment
- Syntheses
- **NEW:** Partnership Development
- Workshops /Conferences

Funding Level

- I: $450,000, 3 years
- II: $3,000,000, 4 years
- III: $5,000,000, 5 years

- Syntheses: $600,000, 3 years
- Partnership Development, up to $100K, one year
- Workshops/Conferences, up to $200,000, one year

DRK-12 Program Strands

Teaching

Aim: Contribute to the development of a science of teaching that addresses the complexity of how people facilitate other people's STEM learning.

Focus on **teacher knowledge, beliefs, and practice**s as the unit of analysis. Student learning outcomes can be framed as evidence of innovative approaches' effectiveness.

Key questions to address:

- How does the proposed innovation or approach align with current STEM education frameworks?
- How is the innovation or approach an improvement, and why and how it would lead to improved outcomes for teachers and students?

NOTE: Budgets should offer fair and meaningful remuneration for teacher participants.

Learning

Aim: Provide *all* students with STEM learning experiences that prepare them to: understand and use scientific information, serve their communities, and participate in future education and workforce opportunities.

Focus on **student learning and other characteristics as the unit of analysis.** Teacher professional development and related outcomes can be assessed as part of the innovation's efforts to support student outcomes.

Key questions to address:

- How does the proposed work align with current frameworks, understandings of child and youth development, and evidence of how students engage with and learn STEM content?
- How is the proposed work an *improvement* relative to students' current opportunities to learn?

Questions?

Project Type: Exploratory

- Establish the basis for the design and development of an intervention
  - Explore relationships among design features and outcomes
  - Must have a conceptual framework or theory of action

- Needs to provide evidence of factors associated with learning outcomes

Project Type: Design & Development

Goals

- specify the practical problem the project intends to address;
- justify the importance of the problem;
- describe how your idea differs from existing practice
- why your ideas are likely to lead to improvements in practice, teaching, learning, etc.

Theory

- strong theoretical and empirical justification for the proposed approach;
- compelling rationale for how features/components are expected to achieve intended outcomes
- include a well-explicated theory of change or logic model

Project Type: Impact

- Impact Studies expand the evidence of promise from previous studies to provide more rigorous evidence of the strength of the STEM education innovation or approach to achieve its intended outcomes.
- Efficacy or effectiveness studies
  - Efficacy: impact under ideal conditions
  - Effectiveness: impact under “normal” conditions
- Should include evidence from experimental or quasi-experimental designs

Project Type: Implementation & Improvement

- **Aim:** Strengthen the capacity of an organization ***to reliably produce*** valued STEM education outcomes for diverse groups of students.
- Requires deep engagement and collaboration of researchers and practitioners on problems of practice that are co-defined and of value to researchers and education agencies, such as a school district or community of schools.
- Must clearly articulate the shared goal of the researcher/practitioner collaborators; the conceptual frameworks for implementation and improvement in the educational system; and the methodological approach for the study.
- May involve varied approaches but methods should align with the project goals.

Project Type: Measurement & Assessment

- Focused on the development assessment ***for*** STEM teaching and learning or ***of*** STEM teaching and learning
- Proposals should carefully specify the STEM constructs, target population, and intended use of the measurement instrument.
- The approach for developing the measurement instrument and protocols must be clearly detailed and justified.
- A plan for demonstrating how the measure will allow for valid and reliable inferences of the constructs being assessed is critical.
- **Fairness** must be considered and when appropriate, demonstrated in all facets of the development, testing, and use of the measurement instrument.

Project Type: Synthesis

- May be in the form of a literature review, qualitative or mixed methods meta-synthesis and/or meta-analysis.
- Should demonstrate a command of the breadth and depth of the literature on the question, issue, or topic and use that knowledge to frame the proposed scope of work.
- See technical requirements in the solicitation for meta-analysis and meta-syntheses proposals.
- Note: Synthesis proposals are up to $600,000 and three-years duration.

Relevant Program Aim: Build the field of STEM education by supporting knowledge synthesis and the development of novel and robust assessments of teacher and student learning, engagement, and skills.

Questions?

Other Project Types: Partnership Development

- Partnership Development proposals can request up to $100,000 for one year.
- Connections and co-design among district and school administrators, teachers, researchers, and other community stakeholders are critical infrastructure in applied research and development efforts that are situated in formal education settings. Partnership Development projects must include preK-12 school partners and researchers.
- Proposals should articulate how and why they seek to intentionally build new, or expand existing, collaborations as well as how the activities will result in, or contribute to, DRK-12 research and development program goals.
- Provide a clear plan and/or framework for fostering relationship development, power sharing, decision-making, and identifying future proposed projects that ensure ***reciprocal benefits.***
- **Proposals should have a formal mechanism to assess the project's progress** and describe the steps that will be taken to provide feedback on processes, and how to make improvements in the team's functioning.
- The Project Description is limited to 8 pages.

Other Project Types: Workshops or Conferences

- Workshop/Conference proposals are up to $200,000 and one-year duration.
- Proposals can be submitted at any time; there is no specific due date for Workshop & Conference proposals. Proposals should focus on an issue of importance to DRK-12 program priorities as well as a clear statement of how the activities will result in, or contribute to, DRK-12 research and development program goals.
- Convenings focused on facilitating the ***reciprocal exchange of knowledge and expertise*** between STEM researchers and preK-12 education professionals are particularly welcome. Other areas of interest include the integration of advanced and emerging technologies into preK-12 STEM classrooms and supporting preK-12 STEM education's capacity to respond to emerging societal grand challenges.
- Proposers are encouraged to consider **multi-stage convenings** (rather than a single event concentrated over several days) that allow time for collective knowledge building and diverse modes of participation.
- Follow the specific guidance in the solicitation and in the PAPPGG Chapter II.F.9.

Questions?

NSF's Merit Review Criteria

1. What is the **potential** for the proposed activity to:
   a. **Intellectual Merit:** Advance knowledge and understanding within its own field or across different fields
   b. **Broader Impacts:** Benefit society or advance desired societal outcomes?

2. To what extent do the proposed activities suggest and explore creative, original, or **potentially transformative concepts**?

3. **Research plan**: Well-reasoned, well-organized, and based on a sound rationale?

4. **Personnel:** How well qualified is the individual, team, or organization to conduct the proposed activities?

5. **Resources:** Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

Considerations for Stronger Proposals

- Does the concept align with the program to which you are submitting?
- Is the proposed work grounded in relevant research?
- Have you addressed the NSF Merit Review Criteria?
- About the writing:
  - Think about terminology and writing style. Limit jargon.
  - Tone and Content
  - Get to the point
  - Who, What, When, Where, How, Why, and So What!
  - Reader-friendly format

Priorities as expressed by Dear Colleague Letters

- ***Not*** new funding opportunities
- Call the field's attention to existing funding opportunities that will accept proposals in areas of interest.
- Examples
  - NSF 23-078: DCL: Supporting Knowledge Mobilization for PreK-12 and Informal STEM Learning and Teaching
  - NSF 23-115: DCL: Advancing Microelectronics Education
  - NSF 23-097: DCL: Rapidly Accelerating Research on Artificial Intelligence in K-12 Education in Formal and Informal Settings
  - NSF 21-114 DCL: Research to Improve STEM Teaching, Learning, and Workforce Development for Persons with Disabilities
- The program also welcomes proposals focused on teaching and learning in any STEM field(s) and on priorities identified in the National Science Foundation's strategic plan.

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Thank you and best wishes in preparing your proposal.

Contact us: DRLDRK12@nsf.gov