NATIONAL SCIENCE FOUNDATION
2415 EISENHOWER AVENUE
ALEXANDRIA, VIRGINIA 22314

NSF 21-114

Dear Colleague Letter: Research to Improve STEM Teaching, Learning, and Workforce Development for Persons with Disabilities

August 25, 2021

Dear Colleagues:

The National Science Foundation's (NSF's) Directorate for Education and Human Resources (EHR) wishes to notify the community of its intention to support fundamental and applied research on science, technology, engineering and mathematics (STEM) teaching, learning, and workforce development for persons with disabilities, as defined by the Individuals with Disabilities Education Act (Sec. 300.8). NSF intends to support fundamental and applied research and the development of innovative STEM teaching and learning approaches to be implemented for persons with disabilities from the earliest developmental stages of life through participation in the workforce. This notification identifies opportunities for such research and development through the following programs:

- EHR Core Research (ECR:Core) (NSF 21-588)
- Building Capacity in STEM Education Research (BCSER) (NSF 20-521)
- Discovery Research preK-12 (DRK-12) (NSF 20-572)
- Improving Undergraduate STEM Education: Education and Human Resources (IUSE) (NSF 21-579)
- Faculty Early Career Development Program (CAREER) (NSF 20-525)
- Advancing Informal STEM Learning (AISL) (21-599)
- Innovative Technology Experiences for Students and Teachers (ITEST) (NSF 19-583)
- Research on Emerging Technologies for Teaching and Learning (RETTL) (NSF 20-612)
- Innovations in Graduate Education Program (IGE) (NSF 20-595)
- NSF Research Traineeship Program (NRT) (NSF 21-536)
- Centers of Research Excellence in Science and Technology (CREST) (NSF 18-509)
- Alliances for Graduate Education and the Professoriate (AGEP) (NSF 21-576)

NSF invites proposals focused on advancing knowledge and developing innovative research-

based interventions to improve STEM teaching, learning, and workforce development for individuals with disabilities. Research about persons with disabilities in STEM and STEM education includes fundamental and applied research, with a particular focus on efforts to understand and address disability-based differences in STEM teaching, learning, workforce preparation and employment. Proposers are encouraged to explore a wide range of fundamental and applied research and development projects that may address, but are not limited to, areas such as:

- The cognitive and neurological underpinnings of learning disabilities (such as attention, working memory, spatial reasoning, or executive function) in the context of STEM education and/or employment;
- Theoretical constructs about self-regulated learning by students with disabilities (such as meta-cognition, strategic action, learning motivation, and self-efficacy) in the STEM disciplines;
- Computer and on-line training programs for improving mathematics learning and performance for students with dyslexia and other specific learning disabilities;
- Developmental trajectories of persons with specific learning disabilities in STEM education and professional disciplines over time;
- Research on the development and/or accessibility of exhibits, media products, and after-school programs, or innovative models, programs, technologies, assessments, resources, or systems in informal STEM learning environments;
- Instructional practices for young students with disabilities who are not responsive to typical mathematics and/or science classroom instruction;
- The auditory processing and learning mechanisms employed by students with visual impairments, and/or visual processing and learning mechanisms employed by students who are deaf or hard of hearing, in the context of learning in the STEM disciplines;
- The development of measures in the STEM disciplines that support valid and reliable observations (e.g., progress monitoring tools or dynamic assessments) for students with disabilities;
- Effective professional development for teachers of students with disabilities;
- The stereotype and identity threat that persons with disabilities experience in STEM classrooms, research settings, and workplaces;
- The institutional, societal, and organizational characteristics that influence STEM learning, educational, and career pathways for students with specific types of disabilities;
- The systemic and institutional characteristics and approaches related to access, equity and inclusion for persons with disabilities in STEM education and the workforce, especially those who are also female and/or members of racial and ethnic groups that are underrepresented in STEM disciplines; and
- How to improve STEM outcomes for individuals with specific learning disabilities, including dyslexia.

As described in the above-referenced NSF programs, a wide range of research activities may be supported. Proposed fundamental and applied research may involve the collection of new data and/or secondary analyses that leverage extant state, national, international or other databases.

In addition, NSF is interested in supporting proposals focused on building capacity for research on STEM education for persons with disabilities through synthesis projects and conferences related to advancing research and understanding of individuals with disabilities.

- Synthesis proposals seek support for the synthesis and/or meta-analysis of existing knowledge on a topic of critical importance to STEM learning and/or education, or for the diffusion of research-based knowledge. Examples of syntheses in this area could include the clarification of the current status of research relative to cognition and mathematics learning disabilities or clarifying identification and screening procedures for mathematics learning disabilities.
- Conference proposals seek support to conduct well-focused conferences related to the research goals of the program. Guidance on the preparation and submission of a Conference proposal is contained in Chapter II.E of the NSF Proposal & Award Policies & Procedures Guide (PAPPG). Investigators are strongly encouraged to contact a program officer prior to submission to discuss their ideas.

Proposals responding to this DCL should be submitted by the due date (if any) of the relevant NSF program. When responding to this DCL, please include "Disability DCL:" at the beginning of the proposal title or immediately following any solicitation specific title prefix. Proposals should be prepared and submitted following the guidance in the PAPPG and also must adhere to the guidance specified in the relevant program solicitation. NSF strongly encourages early career faculty to submit proposals.

For proposers interested in submitting proposals to support or increase the engagement of persons with disabilities in STEM fields, please see the related DCL: Persons with Disabilities - STEM Engagement and Access (NSF 21-110).

Principal investigators interested in submitting proposals (or with other questions pertaining to this DCL) may contact: DisabilityResearch@nsf.gov.

Sincerely,

Sylvia M. Butterfield
Acting Assistant Director
Directorate for Education and Human Resources