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Webinar agenda

- Introduction to the IUSE: EHR Program
- IUSE: EHR Program organization
 - Tracks and levels
 - Workshop and conference submissions
- Questions?
- Program Expectations
- NSF Review Criteria – Intellectual Merit and Broader Impacts
- Questions?

Note: The webinar will include several Q&A sessions. Participants will use the Q&A box in the platform to ask questions.



Introduction to the IUUSE: EHR Program



IUSE: EHR calls for projects to...

- Improve the quality and effectiveness of the education of undergraduates in all STEM fields
- Improve undergraduate STEM teaching and learning for all students and/or the institutional environment where they occur

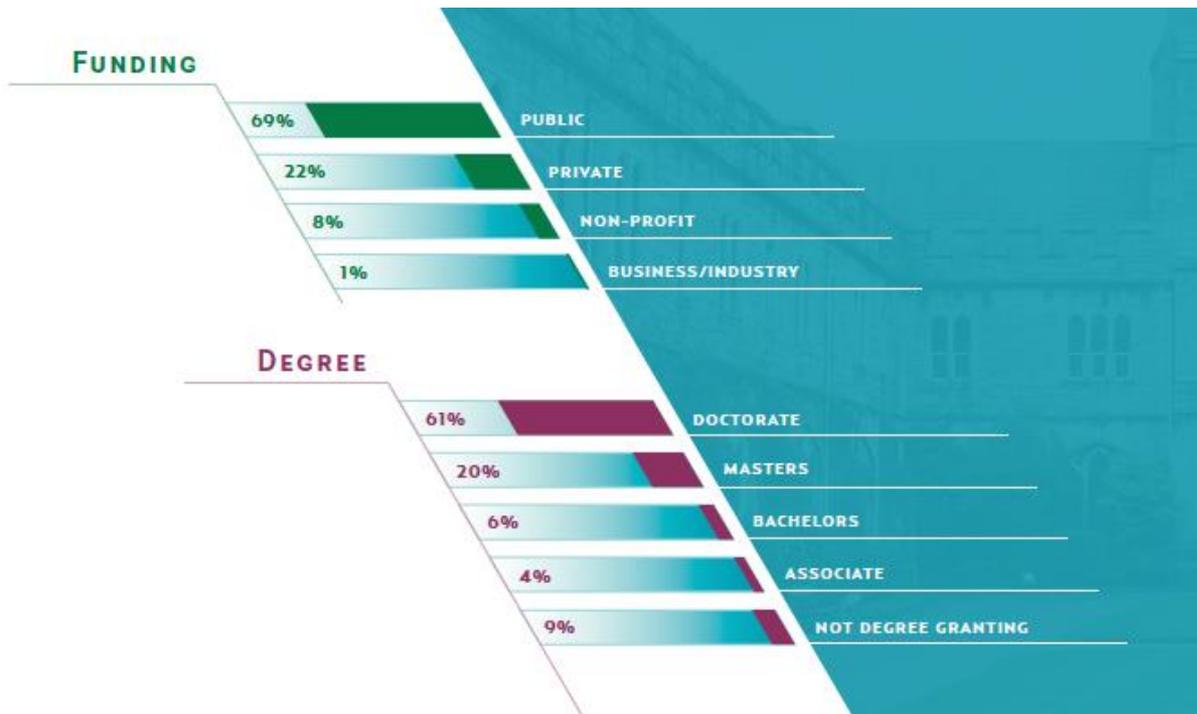


Who can apply?

- Proposals are accepted from all types of institutions of higher education and from professional societies and organizations that work with or represent those institutions



What institutional types has IUSE funded?



IUSE: EHR Program Organization

Two program tracks:

- **Engaged Student Learning:** development, testing, and use of teaching practices and curricular innovations that will engage students and improve learning, persistence, and retention in STEM
- **Institutional and Community Transformation:** transformation of colleges and universities to implement and sustain highly effective STEM teaching and learning



Engaged Student Learning

- Focuses on improving student learning (directly or indirectly)
- Supports development of improved instructional materials and/or methods
- Aims to engage students, improve learning, and increase retention in STEM



Engaged Student Learning

Range of approaches including (but not limited to):

- Development and implementation of novel instructional methods and technologies
- Design and assessment of metrics to measure STEM teaching and learning or student outcomes
- Faculty learning through professional development
- Discipline-based or interdisciplinary educational research
- Re-envisioning or adaptation of learning environments
- Co-curricular activities that increase student motivation and persistence in STEM
- Synthesis or meta-analysis of prior work
- Collaborations between 2-year and 4-year institutions to develop innovative pathways for transfer and student success



Institutional and Community Transformation

- Focuses on improving evidence-based instruction by academic departments, institutions, and other organizations or communities
- Supports efforts to build and understand systemic change in undergraduate STEM education
- Aims to use appropriate theories of change to transform institutions



Institutional and Community Transformation

Range of approaches including (but not limited to):

- Transformation of high-enrollment classes to include evidence-based teaching practices
- Developing teaching evaluation rubrics rooted in a research-based framework
- Development of faculty communities to improve accessibility or sustainability of evidence-based practices
- Identifying best practices to guide institutional transformation
- Inclusion of non-tenure-track faculty or instructors through policy or professional development
- Identification of common elements across disciplines, programs, institutions, or systems that support students from underrepresented groups to be successful in STEM



Institutional and Community Transformation proposals should....

- Describe **theory of change**.
- Include **research literature and theoretical perspectives** concerning change.
- Recognize STEM higher education as a **complex system**.
- Promote institutional change and include:
 - **Teams** of faculty members
 - **Support** from the department chairs, college deans, or others within the institution's academic leadership
 - **Support** from Provosts or Presidents



Levels for ICT projects

Three levels of funding are available depending upon the scope and scale of your project.

- Capacity-Building: \$150k for single institution or \$300k for multiple institutions, up to 2 years
 - Enable institutions that have not served as the lead institution on a prior ICT award to identify a project of interest.
- Level 1: \leq \$300k, up to 3 years
 - Support smaller, early-stage institutional and community transformation projects
- Level 2: \$301k - \$2M for single institution or \$3M for multiple institutions, up to 5 years
 - Support design and development work or impact research that examines and/or incorporates broad communities of institutions, departments, or faculty. Expected to contain robust research plans including either significant research questions or large-scale evaluation efforts, along with appropriate assessment efforts.



Program Deadlines

- Level 1, 2, & 3, and Capacity-Building proposals:
 - **July 21, 2021** (and the third Wednesday in July thereafter)
- Level 1 and Capacity-Building proposals :
 - **January 19, 2022** (and the third Wednesday in January thereafter)



Workshops and Conferences

Conference and workshop proposals addressing diversity in STEM teaching and learning and those involving collaborations of educational researchers and disciplinary scientists to ensure that STEM teaching reflects cutting-edge STEM disciplinary research are especially encouraged.



Questions?



Program Expectations



IUSE: EHR Program Goals

To build knowledge about STEM teaching and learning at the undergraduate level

Develop novel, creative, and transformative approaches to undergraduate STEM teaching and learning

To incorporate evidence-based practices in STEM teaching and learning for all undergraduates

Adapt, improve, replicate, and include evidence-based practices in STEM teaching and learning

To build and understand systemic change in undergraduate STEM education

Lay the groundwork for sustained departmental, institutional, or community transformation and improvement



Gaining new knowledge

All IUSE: EHR proposals are expected to increase knowledge about effective STEM education through

- Posing one or more research questions OR
- Evaluation of project activities, impacts, or outcomes



Methods of Analysis

- Align research or evaluation methods with the questions posed
- Select appropriate methods to perform the study. These may be:
 - Qualitative
 - Quantitative
 - A mixture of both



IUSE Fact Check (True or False?)

- Q1: All proposals must have a research component.
 - False, but all proposals must generate new knowledge.
- Q2: STEM curriculum development, programmatic pathways, learning resources, assessment instruments, and faculty development may receive funding.
 - True
- Q3: Proposals may focus on both STEM and non-STEM majors
 - True, efforts to improve undergraduate STEM education for either or both is appropriate.
- Q4: Proposals may focus solely on students in a single discipline.
 - True, as well as on multidisciplinary or interdisciplinary STEM education.



IUSE Fact Check (True or False?)

- Q5: An evaluation plan that provides formative and summative assessment of the effectiveness of the project in achieving its goals is required.
 - True
- Q6: Proposals should demonstrate a solid grounding in relevant literature on STEM teaching and learning.
 - True
- Q7: Only colleges and universities may submit proposals
 - False, all categories of proposers in the PAPPG are eligible (including professional societies, companies, nonprofit organizations, etc.)



IUSE Fact Check (continued)

- Which of the following may receive IUSE funding?
 - Use and build evidence** about improved STEM instructional practices
 - Investigate novel instructional tools or learning systems**, including cyberlearning
 - Create, implement, and test program, curricular, course, and technology-driven models** for STEM teaching and learning
 - Develop, implement, and test creative approaches for adoption of education research into disciplinary teaching**
 - Develop and validate assessments/metrics** for undergraduate STEM learning and instructional practice; and
 - Propagate and sustain transformative and effective STEM teaching and learning** through institutional practices or involvement of professional societies
- **Answer—ALL of the above**



Questions?



NSF Merit Review Criteria

Intellectual Merit

Broader Impacts



Merit Review Criteria

Intellectual Merit (IM): What is the potential for the proposed activity to advance knowledge and understanding within its own field or across fields?

- What will we learn from the work?

Broader Impacts (BI): What is the potential for benefitting society or advancing desired societal outcomes?

- Why is the work important to society?



Other review considerations

- To what extent 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 **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?

Please Note: Reviewers are also asked to review Facilities, Equipment and Other Resources, Data Management Plan, Postdoctoral Researcher Mentoring Plan, and required Supplementary Documents.



Is it IM or BI?

In addition to development and implementation of a novel curriculum, the project will include educational research to uncover new information about undergraduate model-based-reasoning through detailed assessment of classroom learning.

- Intellectual merit



Questions?

