High-Quality STEM Teachers: Addressing a Chronic Shortage in the US

ACTION

Members of Congress should:

- **Support appropriations matching the authorization levels for NSF's Robert E. Noyce Teacher Scholarship Program included in the bipartisan CHIPS and Science Act; and**
- **Champion legislation that improves the program's effectiveness in recruiting and retaining qualified K-12 STEM teachers**

US Shortage of Well-Prepared STEM Teachers

- In 2019, only 20% of high school graduates that intended to pursue a career in STEM were prepared to succeed in their first year as college STEM students due, in part, to a dramatic shortage of qualified STEM teachers.
- In the U.S., **8% of teachers leave the profession annually**, and more than half quit teaching before reaching retirement.

Subject	Percent with major or minor and/or certification in main subject area
Physics	37%
Biology	65%
Chemistry	34%

Source: Schools and Staffing Survey, 2012

An Expanded NSF Noyce Program can Address the Shortage

The NSF Robert E. Noyce Scholarship Program has supported more than 12,000 Noyce Scholars in teacher preparation programs at 425 institutions nationwide, bolstering the workforce with new, qualified STEM teachers.

20 Years of Success

425 Institutions [1]

12,000 Noyce Scholars [2]

Noyce scholars are more likely to teach in high-needs schools,[3] to stay in teaching careers longer [4] and have a very high impact on their students' learning compared to other programs [5].

Sources: [1] nsf.gov/awardsearch [2] Sandra Richardson, NSF Program Director [3] Whitfield et al. Teaching and Teacher Education, Vol.103, 2021, 103361, https://doi.org/10.1016/j.tate.2021.103361 [4] https://www.brookings.edu/blog/brown-center-chalkboard/2021/07/16/the-robert-noyce-scholarship-and-the-stem-teacher-pipeline/ [5] Marder et al., Education Policy Analysis Archives, 30(147) 2022 https://doi.org/10.14507/epaa.30.7254

Current Barriers Limiting Effectiveness

- Low stipends and scholarships disincentivize potential future teachers.
- Long loan payback conditions impede entry and may be ineffective at increasing retention in the teaching field.

These provisions do not exist for other NSF-sponsored fellowships.

Solving the Teacher Shortage: How to Attract and Retain Excellent Educators, Podolsky et al. 2016 https://files.eric.ed.gov/fulltext/ED606767.pdf

Steps to Increase Effectiveness

- Fully appropriate the authorized amounts for the NSF Noyce program included in the CHIPS and Science Act
- Authorize NSF to pilot-test and evaluate program initiatives – with a report to Congress after five years – aimed at increasing recruitment and retention of Noyce scholars. Program initiatives could include:
  - Adjusting stipends and scholarships to be at least the cost-of-attendance or to match graduate research assistantships stipends at each institution.
  - Eliminating any payback provision and making the fellowship a traineeship-based program consistent with other NSF-sponsored programs, where Noyce scholars can focus full time on advancing their training.

APS Government Affairs | elsesser@aps.org | (202) 846-8121 | cvd.aps.org

APS Advancing Physics