NAS Modernizing Mathematics Education for Grades 9-14:
Schield Response to Educator Survey

We are seeking perspectives from math researchers, educators, and users of math and statistics for a consensus study report on modernizing math education for Grades 9-14. Submissions are due by August 20, 2026.

Call for Educator Perspectives on Modernizing Mathematics Education

The roles of the mathematical sciences in science, engineering, and medical research as well as in the broader economy continue to expand. A student's mathematical education in Grades 9-14 can help advance their future goals for daily life, education, and career, or this experience can pose a significant obstacle to their progress.

The National Academies of Science, Engineering, and Medicine [NAS] have convened a committee to conduct a consensus study on mathematical sciences education in Grades 9-14. The committee's report will address how U.S. mathematics education for Grades 9-14 could be modernized to reflect the evolving role of the mathematical sciences and to provide all students with the mathematical tools to pursue their future goals.

For the purposes of this call, Grades 13-14 refer to the first two years of postsecondary education, regardless of institution (including, but not limited to: community colleges, dual-enrollment, technical and workforce education programs, four-year institutions). To read the full project description, please navigate to the project webpage.

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Schield submission (7/17/2026)

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5. In our current context which topics, skills, or requirements in Grades 9–14 mathematics do you think warrant greater emphasis or less emphasis than they currently receive? What tradeoffs should be considered?

Problem: Students aren't introduced to multivariable thinking (confounding and "after taking into account") in any introductory math or stat course. Math is largely responsible (by omission) for the unwarranted connection between disparity and discrimination that has fueled DEI. Students see these associations: 'women make 70 cents for every a dollar a man makes'; 'whites have 67% higher family income than blacks'. Students mistakenly presume these statistical disparities are strong evidence for discrimination. They were never taught that these comparisons -- even if true -- are 'crude' comparisons: they don't take into account important related factors. There is a story behind these statistics.

Intro courses typically overlook multivariable thinking and confounding. At least 3 variables are needed to introduce confounding and multivariable thinking. Students don't see multivariable thinking until Calculus 3 (Differential Equations) or Stat 200. The ASA 2016 GAISE guidelines called for introductory statistics courses to focus on multivariable thinking and confounding.

Solution: Add Statistical Literacy as an intro to (or alternative for) Introductory Statistics. Currently required for all statistics majors at U. of New Mexico (ABQ) and for all incoming students at New College of Florida. Doesn't use Algebra or statistical software. Using weighted averages, students work

multivariable problems to "take into account" the influence of a measured confounder. They learn that over half of these disparities can be eliminated by 'controlling for' a related factor. See articles published by the MAA (https://statlit.org/pdf/2008-Schield-QL.pdf) and the AAC&U (https://statlit.org/pdf/2004SchieldAACU.pdf and https://statlit.org/pdf/2024-Schield-AACU.pdf)

Multivariate thinking can be taught without taking sides in arguing whether a disparity is evidence of discrimination. Math-stat educators can focus on how strongly a given association resists being influenced by confounding or by assembly: how things are defined, counted, measured, grouped, summarized or presented.

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6. Are there important features of mathematical thinking that current educational discussions overlook or underemphasize?

Problem: Statistical significance is another important idea in mathematical thinking involving statistics. Yet, introductory courses overlook the fact that statistical significance based on observational data can be influenced by confounding: by what is -- and is not -- taken into account. This omission allows social scientists to mistakenly use a small p-value as strong evidence for a causal connection. Many -- if not most -- introductory statistics textbooks fail to include confounding in the index.

Solution: By using the lack of overlap between 95% confidence intervals as a sufficient condition for statistical significance, students taking Statistical Literacy can see how easily statistical significance can be influenced when based on observational data. They become aware of the importance of effect size and study design. For details, see https://statlit.org/pdf/2025-Schield-IDSL-StatLit-Keynote-Slides.pdf

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7. How should advances in computation, software, artificial intelligence (current and future models), or other emerging technologies influence mathematics education in Grades 9–14?

Students should be introduced to the underlying mathematical ideas before using computers or AI.

Check out a one-hour video on this course: https://statlit.org/V/2023-Schield-StatLit-Highlights-Slides.mp4 The textbook used in this course is published by Kendall-Hunt: https://he.kendallhunt.com/product/statistical-literacy-2023-critical-thinking-about-everyday-statistics

Students see value in statistical literacy. Many -- if not most-- agree or strongly agree that all students should be required to take statistical literacy.

Note: Mu Sigma Rho, a statistics honorary, awarded their 2026 Statistical Education award to Schield based on “evidence of excellence in classroom teaching in the statistics discipline and … a lifetime devotion to statistics education.” For more on Schield, see www.MiloSchield.com

Sources:

Modernizing Mathematics Education: https://www.nationalacademies.org/projects/DEPS-MSEB-25-01

Survey: https://survey.alchemer.com/s3/8906879/Call-for-Educator-Perspectives-on-Modernizing-Mathematics-Education