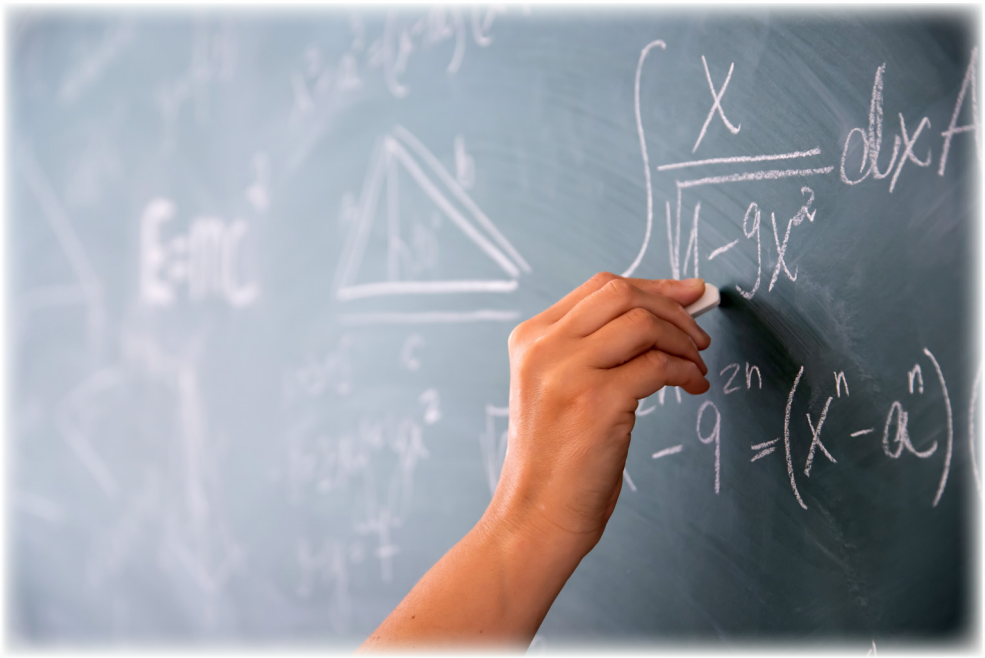
NEPC Review: Navigating the Math Wars: A Practical Guide to the Divides and Debates Influencing Math Instruction (Center on Reinventing Public Education, April 2026)



Reviewed by:

Deborah Loewenberg Ball
University of Michigan

July 2026

National Education Policy Center

School of Education
University of Colorado Boulder
nepc.colorado.edu

Acknowledgements

NEPC Staff

Faith Boninger
Publications Manager

Paul Thomas
Academic Editor

Elaine Duggan
Production Design

Alex Molnar
NEPC Director

Kevin Welner
NEPC Director

Suggested Citation: Ball, D.L. (2026). *NEPC Review: Navigating the math wars: A practical guide to the divides and debates influencing math instruction*. Boulder, CO: National Education Policy Center. Retrieved [date] from https://nepc.colorado.edu/review/math-wars

Funding: This review was made possible in part by funding from the Great Lakes Center for Education Research and Practice.

The National Education Policy Center (NEPC), a university research center housed at the University of Colorado Boulder School of Education, sponsors research, produces policy briefs, and publishes expert third-party reviews of think tank reports. NEPC publications are written in accessible language and are intended for a broad audience that includes academic experts, policymakers, the media, and the general public. Our mission is to provide high-quality information in support of democratic deliberation about education policy. We are guided by the belief that the democratic governance of public education is strengthened when policies are based on sound evidence and support a multiracial society that is inclusive, kind, and just. Visit us at: http://nepc.colorado.edu

NEPC Review: Navigating the Math Wars: A Practical Guide to the Divides and Debates Influencing Math Instruction (Center on Reinventing Public Education, April 2026)

Reviewed by:

Deborah Loewenberg Ball
University of Michigan

July 2026

Summary

As policymakers and educators seek to address concerns about student achievement, engagement, and equity, a new report from the Center for Reinventing Public Education analyzes contemporary disputes about effective mathematics instruction. It addresses five major areas of disagreement: (a) conceptual understanding versus procedural fluency, (b) inquiry-based and direct instruction, (c) productive struggle and support, (d) timed practice and math anxiety, and (e) standard algorithms and invented strategies. Although the report concludes that the disagreements are less polarized than public discourse suggests, its focus on the divides and its emphasis on "science of math" reinforce the idea of "math wars." Its use of broad labels such as "inquiry-based" and "explicit" instruction continue to obscure important similarities (and differences) in practice. Further, the report's analysis would have benefited from a stronger historical and critical analysis of recurring mathematics education debates that explored how the current context differs from the past. While this report provides a helpful review of current public and professional debates about mathematics, in the end it fails to provide nuanced discussions of instructional practice that would support students' mathematical understanding, fluency, reasoning, and engagement.

NEPC
NATIONAL EDUCATION POLICY CENTER

NEPC Review: Navigating the Math Wars: A Practical Guide to the Divides and Debates Influencing Math Instruction (Center on Reinventing Public Education, April 2026)

Reviewed by:

Deborah Loewenberg Ball
University of Michigan

July 2026

I. Introduction

Navigating the Math Wars: A Practical Guide to the Divides and Debates Influencing Math Instruction,[1] recently released by the Center for Reinventing Public Education (CRPE), offers a practical analysis of the current round of public and professional debates about mathematics. It seeks to help state and district leaders sort through competing claims and recommendations when deciding about curriculum and instruction. This report is timely because the current math debate is complicated by the emergence of the "science of math" and "science of learning" rhetoric[2] and because many educators have lived through previous cycles of math reform as professionals, parents, and young people themselves. The continuous reporting[3] of U.S. students' weak mathematics achievement and lack of interest in or identity with math create demand for guidance about how best to support improvement in students' mathematical flourishing.

The report identifies a set of issues central to mathematics teaching and learning and explores the warrants for divergent claims that are broadly circulating. It also situates the current debates in both the long history of contentious disagreements about school mathematics and the recent major shifts to reading instruction based on the "science of reading."[4] In doing so, it gives prominent space to the perspectives based in the science of math.

II. Findings and Conclusions of the Report

The report frames "the 'new' math wars" in the context of previous "math wars."[5] An analysis of five dichotomies undergirding contemporary debates anchors the analysis. The report summarizes each "side," indicating that the dichotomous positions overlap more than assumed. Next, it provides an overview of state legislation and policies regarding mathematics and reading instruction, along with an analysis of recommended and common classroom instructional practices. It concludes with recommendations for ending math education's "forever war."[6]

Based on its characterization of arguments made by John Dewey[7] over a century ago, the report distinguishes between a "traditionalist" view and a "reform" view, claiming that these different positions have fundamentally shaped American education. It argues that "traditionalists" center disciplinary knowledge and a curriculum structured to deliver it to learners while "reformers" prioritize students and the importance of engaging learners in inquiry and problem solving.

Building on this frame of "traditionalist" and "reform" orientations, the report identifies and examines five main issues at the core of the current debates: conceptual understanding and procedural fluency, inquiry-based and direct instruction, productive struggle and support, timed practice and math anxiety, and standard algorithms and invented strategies. To draw the contrasts sharply, the report emphasizes the differences between the positions. For example, the disagreement about conceptual understanding versus procedural fluency is characterized by the order in which students need to develop them––conceptual-first or fluency-first. Yet the report also acknowledges that the disagreement is more nuanced.

In each case, the report argues that the disagreements rest more on how and when to emphasize a particular approach than on whether some version of the approach may be useful. The widest divide, the report claims, lies with debates over timed tests, pitting the importance of students achieving fluent mastery of basic arithmetic facts and computational procedures[8] against concerns about math anxiety.[9]

The report also examines prevailing instructional classroom practices and the spread of legislation across 18 states. It cites several studies documenting that dominant approaches reflected neither "reform" practices nor those advocated by the science of math, but typically involved worksheets and teacher directed instruction.[10] It also refers to observational evidence indicating that conceptual understanding, cognitively demanding tasks, or classroom discourse are not the main emphasis in most classrooms. The analysis finds that legislation addresses early screening, high-quality instructional materials (HQIM), data-based decision making, numeracy at the elementary level, and systematic targeted interventions for "struggling" students. The report argues that the laws are not explicitly aligned with one side or the other nor a particular pedagogical approach, but instead mandate screening, materials, or

interventions.

The report's conclusions focus on the needs for a better evidence base for mathematics instruction; guidance for sequencing and designing instruction based on cognitive load theory, as advanced by science of math proponents; a clear national strategy for strengthening mathematics instruction; and more specific guidance for practice at the level of the classroom coupled with professional learning and use of data. The report also maintains that despite disagreement between camps, a shared commitment to strong mathematics instruction could orient efforts to move from debate to an emphasis on supporting teaching and teachers.

III. The Report's Rationale for Its Findings and Conclusions

The report's examination of the core flashpoints in the math debate highlights that disagreements are less polarized than their caricatured portrayals imply. Several debates center more on the details of approaches or when and how different instructional alternatives should be considered. One example is the hotly debated issue of inquiry-based approaches versus explicit instruction.[11,12] Often portrayed in extreme contrast, these two approaches have some important common ground that the report identifies, such as that both explicitness and inquiry can contribute to student learning, depending on the mathematics learning goals.

Some of the disagreements, the report notes, rest on the lack of common sources of evidence and, further, what different sides consider to be standards of evidence for instructional approaches. It notes that proponents draw on different studies to support their arguments. This often makes it impossible to compare the validity or relevance of their claims.

Thus, the report's conclusions and recommendations center on remedying these problems that undergird the debates and confound rather than support teaching. It proposes creating a stronger shared evidence base for mathematics instruction, providing guidance for practice with attention to learning goals and student needs,[13] and developing a national strategy for mathematics instruction.

IV. The Report's Use of Research Literature

The report's use of literature is complicated by challenges inherent in the sociopolitical and historical contexts of the debates over mathematics instruction. Cognitive psychologists and special education researchers play a large role, and this is amplified in the report. The evidence for each side draws on different bodies of research, rooted in different theoretical frameworks and methodologies, as reflected in the

report's citations.

The interpretation of Dewey's *Child and the Curriculum* upon which the report bases its framing of the "sides" is questionable for many reasons, notably because Dewey was not writing about instruction. But apart from that mismatch, the distinction does function to organize the perspectives on mathematics instruction at the heart of the current debates.

The traditionalist perspective, advanced primarily by psychologists, is grounded in research on special education, struggling learners, cognitive load, and working memory, while the reform perspective, represented more by mathematics education researchers, draws on theories of growth mindset, classroom learning environments, mathematics understanding and reasoning, and students' sensemaking.

The report notes that traditionalists prioritize causal evidence, whereas reformers include qualitative data from classrooms as well as student and teacher perspectives. Those aligned with each perspective associate primarily with members of their own networks and regard the claims and evidence of their own viewpoint as more valid than that of the other group. The report does not adequately acknowledge that this siloing deters efforts to examine the warrants for competing claims. This feature of the current debates is crucial for educators and policymakers to understand as they seek to sift through recommendations and reach valid decisions.

The report also draws on a few studies to represent current practice. Although it would be useful to know how the divisions in the field relate to practice, much too little is known about what is happening in classrooms. The claims about current practice are insufficient to identify how the debates relate to or are influencing mathematics instruction.

V. Review of the Report's Methods

A key feature of the report's methods is its analysis of the polarized discourse by identifying two "sides" as pure positions and then using those to investigate claims and arguments. This strategy helps to uncover the differences between the "camps" as well as to show important areas of intersection. By hypothesizing the two perspectives as distinct and in opposition with each other, the report compares the positions and identifies the sources and nature of their differences. The report clarifies that this working hypothesis is intended as a tool to analyze specific areas of the debate, not to evaluate competing claims.

It doesn't completely work. Although the report claims to offer a balanced account of the "sides" in the current debates, it favors perspectives held by proponents of the science of math.[14] Given the important finding that the positions are less polarized

than the debates suggest, a more even-handed examination of the perspectives is needed than the report offers.

The overview of past periods of mathematics education reform efforts, while useful, does not illuminate how the current iterations of the issues repeat or diverge from prior periods of debate, and so lacks the kind of historical analysis that could help move past the "forever war" to which the report refers. While the science of math raises issues to the surface, it would have been useful to examine which past issues are no longer contentious, or how those previous points of discord relate to the current ones.[15]

In particular, the report overlooks the remarkable development that, unlike during previous rounds of controversy, almost all states have now adopted common learning goals. A particular affordance of shared standards is that the disagreements could move away from *what* students should learn to discussions of *how* they should learn it. Agreeing on the goals could make it possible to consider what is involved in helping students achieve them. It could lead to a more grounded engagement with the work of teaching and students' mathematical flourishing. Calling attention to the existence of standards for learning, and the imperative to attend to them, would strengthen educational leaders' navigation of the current debates. Further, the last decade has seen the introduction of a system for evaluating and rating instructional materials.[16] Whereas prior cycles of contentious debates in mathematics education regularly focused on textbook series, this is not true of this round of arguments. The report would have benefited from a stronger historical analysis and perspective.

Given the report's conclusion that there are not such clear "sides," it would have been helpful to highlight areas of overlap and common ground. For example, more useful than pitting "inquiry" and "explicit" against each other would have been a stronger conceptualization of what each concept means and what it can look like in action when used well for specific mathematical instructional purposes.

Navigating the current debates would be better served by refusing the caricatures of mathematics instruction in which students are guided to inquire into and do mathematics. Equally needed is to promote the importance of less reductionist and more mathematically robust portrayals of explicit instruction. Both "inquiry" and "explicit" approaches are systematic, require mathematical guidance by the teacher, involve structuring students' engagement with the content, and engage students in learning concepts, practicing skills, and reasoning mathematically. They each also set up different opportunities for students' learning. This matters. The constant barrage of extreme examples of both approaches in the report only galvanizes the divide. More careful examination of the instructional approach for different mathematics standards, in different contexts, would have clarified the point that both approaches are effective, depending on the mathematical goal and the students. It would have led to the removal of the word "versus" between "inquiry" and "explicit." It would have also

underscored the discretionary judgment, mathematical knowledge for teaching, and knowledge of one's students required for skillful instructional practice. Research can inform instructional practice but not determine it. The report does not acknowledge this.

Finally, the report's claims about modal classroom practice are not compelling. Although it is useful to understand how the different positions described in the report look in practice, self-report approaches in which teachers respond to particular descriptors (e.g., indicating whether they use "cognitively demanding tasks," "tasks that are accessible to all students," "tasks that are engaging for all students," or "tasks that are culturally relevant to my students") are insufficient because they are subject to biases of interpretation, memory, and reliability.

VI. Review of the Validity of the Findings and Conclusions

The overview of the current debates and examination of the different recommendations for instruction can help bring people together in the interest of U.S. students' mathematical development. However, the report's rhetorical approach backfires by emphasizing the polarization that undermines efforts to improve mathematics education. Consider the example of how it might have addressed computational fluency in a way that would have defused the debate and recentered the discussion on students' learning: It could have clarified that fluency is a reasonable goal in all areas of learning, from language to musical performance, as well as in mathematics. It could have then showcased and further developed methods of promoting mathematical fluency.

Additionally, the absence of two key factors erodes the validity of the report's findings and conclusions. First is the surprising lack of attention to the subject matter of mathematics itself and how it relates to different approaches to math instruction. Second is the lack of attention to instructional practice, especially given the report's centering of priorities for instruction and how to support learning. Educators and policymakers who seek to support improvement in young people's mathematics learning must consider both the content and the nature of teaching practice.

VII. Usefulness of the Report for Guidance of Policy and Practice

This report provides information and explanations that can help educators and decision-makers who are, once again, caught in the crossfire. The report could have been more useful had it been more balanced and less partisan. It overemphasizes

polarization and, ultimately, elevates the approaches associated with the science of math over those advanced by mathematics educators, thereby undermining its claim to provide a balanced analysis. It also could have demonstrated more critical imagination for what it would take to end the "forever math wars." For example, while interdisciplinary research might be important, even more necessary is to build efforts that bring together communities and people with different kinds of expertise and experience. History shows that for this to work well, constructing norms of discourse, respect, and exchange are imperative but have been elusive. The power structures and hierarchies that position research mathematicians, psychologists, or legislators as the arbiters of truth would have to bend and other voices and perspectives be heard. To move past "wars" to a system that successfully supports students to thrive mathematically, it will be important to focus on teaching practice and its complex demands, how it can support learning, and the role of sociopolitical and historical contexts. This report does not attend to these crucial imperatives. Policymakers should review this report with some caution, notably by acknowledging that it may well perpetuate a debate that it purports to help resolve. The report's overview of the issues can help education and policy leaders gain perspective and ask good questions that go beneath the rhetoric to consider the context and the competing claims and consider implications for practice.

Notes and References

1 CRPE (2026, April). *Navigating the math wars: A practical guide to the divides and debates influencing math instruction*. CRPE. Retrieved May 10, 2026, from https://crpe.org/wp-content/uploads/Navigating-the-Math-Wars-2026.pdf

2 See, for example: https://www.thescienceofmath.com/
https://www.nea.org/nea-today/all-news-articles/science-learning
https://educationscorecard.org/wp-content/uploads/2026/05/Education_Scorecard_May_2026_Report.pdf

The science of math (n.d.) [website]. Retrieved July 9, 2026, from https://www.thescienceofmath.com/

Deans for Impact (2026). The science of learning [website]. Retrieved July 9, 2026, from https://www.deansforimpact.org/tools-and-resources/the-science-of-learning

3 For example:

Lumpkin, L. (2026, June 10). Why low U.S. math scores are concerning researchers and economists. *Washington Post*. Retrieved July 8, 2026, from https://www.washingtonpost.com/education/2026/06/10/math-scores-remain-lower-than-decade-ago-its-bad-sign-economy/

4 For example:

Lurye, S. (2023, September 12). The 'science of reading' swept reforms into classrooms nationwide. What about math? *Hechinger Report*. Retrieved July 8, 2026, from https://hechingerreport.org/the-science-of-reading-swept-reforms-into-classrooms-nationwide-what-about-math/

For history and analysis of the "Science of Reading" debate, see:

Thomas, P.L. (2022). *The Science of Reading movement: The never-ending debate and the need for a different approach to reading instruction*. Boulder, CO: National Education Policy Center. Retrieved July 8, 2026, from https://nepc.colorado.edu/publication/science-of-reading

5 Schoenfeld, A. & Phil Daro, P. (2024, March 21). More math, less "math war." *Science, 383* (6689). Retrieved July 6, 2026, from https://www.science.org/doi/10.1126/science.adk6419

Crary, A. & Wilson, W.S. (2013, June 16). The faulty logic of the 'math wars.' *New York Times*. Retrieved July 6, 2026, from https://archive.nytimes.com/opinionator.blogs.nytimes.com/2013/06/16/the-faulty-logic-of-the-math-wars/

6 Appendices provide definitions of common terms (such as "inquiry-based" and "explicit systematic" instruction), a list of the "post-pandemic instructional priorities," state policies and legislation focused on the science of math, and a one-page description of foundational instructional practice for "struggling" students.

7 Dewey, J. (1902). *The child and the curriculum*. University of Chicago Press.

8 Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science, 12*(2), 257–285. Retrieved July 6, 2026, from https://doi.org/10.1207/s15516709cog1202_4

9 See especially pp. 21–22 in CRPE (2026, April). *Navigating the math wars: A practical guide to the divides and debates influencing math instruction*. CRPE. Retrieved May 10, 2026,

from https://crpe.org/wp-content/uploads/Navigating-the-Math-Wars-2026.pdf

10 Tekkumru-Kisa, M., Schweig, J., Kaufman, J. H., Steiner, E. D., Gittens, A. D., & Holmes, P. (2025). *Teachers' use of high-leverage teaching practices in mathematics classrooms* (WR-A2836-1). RAND Corporation. Retrieved July 6, 2026, from https://doi.org/10.7249/WRA2836-1

11 See for example:

Gersten, R., Chard, D., Jayanthi, M., Baker, S., Morphy, P., & Flojo, J. (2009). Mathematics instruction for students with learning disabilities: A meta-analysis of instructional components. *Review of Educational Research, 79*(3), 1202–1242; Retrieved July 6, 2026, from https://journals.sagepub.com/doi/abs/10.3102/0034654309334431

Doabler, C.T., Baker, S.K., Kosty, D.B., Smolkowski, K., Clarke, B., Miller, S.J., & Fien, H. (2015). Examining the association between explicit mathematics instruction and student mathematics achievement. *The Elementary School Journal, 115*(3), 303–333. Retrieved July 6, 2026, from https://doi.org/10.1086/679969

12 See, for example:

Demszky, D. & Hill, H.C. (2023). The NCTE transcripts: A dataset of elementary math classroom transcripts. In E. Kochmar, J. Burstein, A. Horbach, R. Laarmann-Quante, N. Madnani, A. Tack, V. Yaneva, Z. Yuan, & T. Zesch (Eds.), *Proceedings of the 18th workshop on innovative use of NLP for building educational applications (BEA 2023)* (pp. 528–538). Association for Computational Linguistics. Retrieved July 6, 2026, from https://doi.org/10.18653/v1/2023.bea-1.44

Erath, K., Prediger, S., Quasthoff, U., & Heller, V. (2018). Discourse competence as important part of academic language proficiency in mathematics classrooms: The case of explaining to learn and learning to explain. *Educational Studies in Mathematics, 99*(2), 161–179. Retrieved July 6, 2026, from https://doi.org/10.1007/s10649-018-9830-7

Kazemi, E., & Stipek, D. (2001). Promoting conceptual thinking in four upper-elementary mathematics classrooms. *The Elementary School Journal, 102*(1), 59–80. Retrieved July 6, 2026, from https://doi.org/10.1086/499693

13 For example, indicating which instructional methods are best for developing fluency and which are recommended for developing reasoning about integer arithmetic.

14 For example, while Appendix B lists instructional priorities aligned with that perspective, it provides no parallel list of instructional priorities aligned with state standards for mathematics learning. Moreover, the list in Appendix B is a set of policy priorities, not instructional ones––for example, "foundational numeracy in grades K-5" is described as a primary policy target. Not mentioned is that this state policy priority diverges from states' mathematics standards that include, for example, geometry and algebraic reasoning as goals for students' learning. Appendix D presents a detailed description of the foundational practice of systematic explicit instruction but includes no such description of structured inquiry-oriented instruction.

15 For example, some of the past disagreements focused on the place of manipulatives, contextualized versus "naked" problems, calculator use, and problem solving. Are the current issues simply earlier iterations of previous arguments? Or are these past issues no longer objects of disagreement?

16 A nonprofit organization, Ed Reports (https://edreports.org/), developed a process for analyzing

materials and based on judgments of their coherence, rigor, usability, and instructional supports, awards a “green light” to those materials that meet all of the criteria. These “high-quality instructional materials,” or HQIM, are more likely to be selected by districts and schools.