

New Guidebook Gives Colleges the Tools to Transform Introductory Mathematics

Project EMBER's Evidence-Based Framework Tackles Higher Education's Most Persistent Academic Barrier

Boulder, CO (TBD) – Every Learner Everywhere, in partnership with TPSE Math, Project EMBER, the Association of Public and Land-grant Universities (APLU), and the Association for Undergraduate Education at Research Universities (UERU), today released [*Eliminating Mathematics Barriers through Evidence-based Reforms: A Guidebook*](#), a comprehensive resource designed to help colleges and universities reform the introductory mathematics courses that derail more students from college completion than any other academic obstacle.

Introductory college mathematics carries the highest DFW (D grade, F grade, or Withdrawal) rates on most campuses, disproportionately affecting students from historically underserved communities. Despite decades of research demonstrating that proven reforms exist, from active pedagogy and corequisite course models to redesigned math pathways and technology-enabled curricula, widespread adoption has remained uneven. The new guidebook, authored by April Ström (Chandler-Gilbert Community College), Mary E. Pilgrim (San Diego State University), and Jessica Gehrtz (University of Texas at San Antonio), gives institutions a structured, step-by-step framework for turning that research into action.

“The problem is not a lack of effective solutions,” says TPSE’s executive director Dave Kung. “Implementing many of those solutions requires knowledge and support. We are thrilled to offer up a resource to help faculty & institutions.”

The guidebook centers on a three-milestone model: empowering a cross-functional team, assessing current practices, and planning for transformation. It introduces the Project EMBER [Self-Assessment Tool](#): seven rubrics covering everything from student success data and course structure to instructor professional development and instructional assessment, and walks teams through a collaborative visioning process that produces a shared, actionable direction for change.

A defining feature of the guidebook is its emphasis on teaching-focused faculty (TFF), the instructors who teach and coordinate the majority of introductory mathematics courses at research universities. Internal Project EMBER data show that TFF make up roughly one-fourth of full-time faculty at research institutions, yet are often left out of institutional decision-making. The guidebook explicitly positions TFF as the primary drivers of sustainable



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innovation, while simultaneously engaging department chairs, deans, provosts, advisors, and students as essential partners.

"There's more teaching-focused faculty out there than ever before," says Melissa Lindsey, the University of Wisconsin's Director of Instructional Staff Operations and one of the Project EMBER leaders. "Empowering them will be critical to the success of our efforts."

The resource closes with a detailed case study, illustrating how a large, urban research university applied the guidebook's framework across College Algebra, Precalculus, and Calculus I, ultimately adopting active learning, corequisite supports, and tightened course coordination to improve outcomes across the sequence.

[*Eliminating Mathematics Barriers through Evidence-based Reforms: A Guidebook*](#) is freely available through the Every Learner Everywhere resource library and is licensed under a Creative Commons Attribution-No Derivatives 4.0 International License. The guidebook is intended for faculty, department chairs, deans, provosts, advisors dedicated to addressing student success rates and improving upon the learning experience in introductory math.

To download [*Eliminating Mathematics Barriers through Evidence-based Reforms: A Guidebook*](#) or learn more about Every Learner Everywhere and its collaborative approach to improve student success in higher education through digital learning, visit everylearnereverywhere.org. To contact Every Learner Everywhere, email everylearner@wiche.edu, or call (303) 541-0208. Follow Every Learner on LinkedIn at [Every Learner Everywhere](#).

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Every Learner Everywhere is a network of partner organizations with expertise in evaluating, implementing, scaling, and measuring the efficacy of education technologies, curriculum and course design strategies, teaching practices, and support services that personalize instruction for students in blended and online learning environments. Our mission is to partner with institutions to harness digital learning technology, driving innovation in higher education to improve outcomes for every learner. We build capacity in colleges and universities to improve student outcomes with digital learning through direct technical assistance, timely resources and toolkits, and ongoing analysis of institutional practices and market trends. [WCET](#) (the WICHE Cooperative for Educational Technologies) and [WICHE](#) (the Western Interstate Commission for Higher Education) serve as the intermediary organizations for the Every Learner Everywhere Network. For more information about Every Learner Everywhere and its collaborative approach to advance student success in higher education through digital learning, visit everylearnereverywhere.org.

TPSE Math is a professional organization of mathematicians dedicated to ensuring that all high education students – regardless of their background, zip code, identity, or chosen program of study – develop the modern mathematical knowledge and skills they need for productive engagement in society and in the workplace. TPSE aims to identify effective practices where they exist, advocate for innovation where they do not, and work with and through partners to implement and scale research-based practices. In all of its work, TPSE strives to ensure that students and society are enriched by the power and beauty of mathematics.

Project EMBER aims to build a network of 50-100 institutions that empowers teaching-focused faculty at research institutions to adapt evidence-based reforms in introductory mathematics, track progress to improve overall student success and eliminate equity gaps, all in collaboration with departmental and institutional leaders.

The **Association of Public and Land-grant Universities (APLU)** is a research, policy, and advocacy organization dedicated to strengthening and advancing the work of public universities in the U.S., Canada, and Mexico. The association's membership consists of more than 250 public research universities, land-grant institutions, state university systems, and affiliated organizations. The association and its members collectively focus on: increasing student success and workforce readiness; promoting pathbreaking scientific research; and bolstering economic and community engagement. Drawing on the powerful collective action of its members, APLU's advocacy arm helps shape federal policy that maximizes the positive impact of public and land-grant universities.

The **Association for Undergraduate Education at Research Universities**, or UERU, is a national consortium of R1/2 research university leaders with expertise in the theory and practice of undergraduate education. UERU includes a robust network of Undergraduate Vice Provosts/Presidents – strategically positioned leaders who work collaboratively with their colleagues to advance equity and excellence in undergraduate education.