

Bridging the gap in mathematics education: Digital dissemination as a support mechanism for implementation

Eleany Barrios Borges ¹ 

Problem statement

The landscape of mathematics education faces a persistent paradox: while research in mathematics didactics has advanced significantly over the last century, the dynamic within the math classroom remains largely static. This stagnation is not due to a lack of rigorous research, but rather a failure in the mechanisms of transfer. In the current Mexican context, this issue is exacerbated by the implementation of the Nueva Escuela Mexicana (New Mexican School; Secretaría de Educación Pública [SEP], 2022). This policy reform operates as a top-down mandate, requiring significant pedagogical shifts—such as the transition from rote memorization to Project-Based Learning and STEAM integration—often without providing the necessary institutional training to execute them.

Consequently, mathematics teachers are left with a policy mandate but without the practical how-to. Faced with this void, educators resort to a bottom-up strategy and turn to the internet. This digital search is not merely for entertainment; it acts as a survival mechanism to find immediate solutions for complex mathematical concepts when institutional training is slow or nonexistent. However, a significant barrier remains: the gap between

¹ eleany.barrios@cinvestav.mx

Center for Research and Advanced Studies (Cinvestav), Mexico City, Mexico

Barrios Borges, E. (2026). Bridging the gap in mathematics education: Digital dissemination as a support mechanism for implementation. In M. S. Aguilar & M. Misfeldt (Eds.), *Proceedings of the First Implementation and Replication Studies in Mathematics Education Conference: IRMEC 2025* (pp. 149–152). Editorial SOMIDEM. <https://doi.org/10.24844/SOMIDEM/S3/2026/03-20>

the specialized disciplinary reality of mathematics education research and the narrative reality of the classroom.

How is it addressed?

To address this gap, this project draws upon the foundational distinctions between diffusion, dissemination, and implementation within the specific domain of mathematics education. As Century and Cassata (2016) note, implementation research has deep roots in Diffusion Theory, which links macro-level system changes to micro-level individual behaviors. While “natural diffusion” explains how ideas spread organically, complex reforms in mathematics education—which require deep conceptual changes in pedagogy—require more than passive spread.

We must distinguish between diffusion and dissemination (active efforts to spread knowledge). However, dissemination alone is insufficient. The ultimate goal is implementation, understood as the enactment of innovations in practice. In the field of mathematics education, the challenge is heightened because curriculum developers are often unsure which elements are truly “critical” for success, creating ambiguity for the teacher.

Confrey et al. (2000) argue that implementation research in mathematics education must “model and document the interrelations among system components identifying the catalysts and impediments to change” (p. 182). Furthermore, this project assumes that educators are not passive recipients but active designers who adapt materials.

Therefore, this project posits the proposed YouTube channel not merely as a content repository, but as an “intermediary organization” or change agent. This mediator facilitates the “transportability” of evidence-based pedagogical practices into real-life settings. It aids the didactic transposition process, helping teachers distinguish between the “core components” of the mathematics curriculum and the adaptable features necessary for their specific classroom context.

This paper presents a pilot project for innovation in academic dissemination based on the “re-narration” of research findings. This methodology is implemented through a YouTube channel designed to translate research articles on mathematics education into implementable and understandable resources for everyday teaching. The project is framed within the literature on diffusion of innovations (Rogers, 2003), knowledge mobilization (Levin, 2013), and educational implementation studies (Century & Cassata, 2016), with the aim of complementing traditional academic media and offering a disruptive alternative for teachers who do not have access to scientific publications.

The methodological process for transforming articles into practical resources via re-narration includes:

1. Selection of relevant articles in specialized journals.
2. Extraction of the central idea and didactic potential (e.g., tasks, models, sequences).
3. Translation of academic language into accessible and narrative discourse.
4. Contextualization through examples applicable in the classroom.
5. Audiovisual production in a short and attractive format.
6. Open dissemination on the freely accessible channel.

What is implemented?

A first prototype of this process is now available. The video *Educación ciudadana y ciencias de datos en el aula* [Citizenship education and data science in the classroom] (Barrios Borges, 2025) demonstrates how the research by Makar et al. (2023) is re-narrated into an implementable classroom experience. It presents activities for collecting and analyzing data, a step-by-step example where students examine their online interactions and construct their own graphs, and reflections on integrating mathematics, social sciences, and technology into lessons relevant to everyday life. This prototype has not yet undergone formal evaluation; assessing teacher uptake and classroom use is planned as the next phase of the project.

Implications and significance

The significance of this project extends far beyond content delivery; it seeks to fulfill the ethical mandate of scientific inquiry by closing the gap between theory and practice. This initiative proposes a threefold impact on the educational ecosystem:

1. Democratization for the Teacher: It empowers educators to effectively meet the demands of the Nueva Escuela Mexicana by providing accessible, high-quality professional development. This approach circumvents traditional institutional latency, offering immediate support to teachers and specifically mitigating the uncertainty often associated with adopting new paradigms.

2. Validation for the Researcher: The project is designed to establish a bidirectional feedback loop. By analyzing how teachers interact with and implement these digital resources, researchers will gain valuable insights into ecological validity—understanding how theories function in diverse, real-world contexts. This would validate academic constructs through the lens of classroom practice.

3. Impact on the Student: Ultimately, the student is the primary beneficiary. Mathematics often functions as a “gatekeeper” subject, creating barriers to academic advancement. By equipping teachers with effective, evidence-based pedagogical tools, we ensure that scientific knowledge

reaches its intended destination. This fulfills the fundamental ethical imperative of research: to improve the human condition by enhancing the quality and equity of mathematical learning.

References

- Barrios Borges, E. [Eleany Barrios Borges]. (2025, January 10). *Educación ciudadana y ciencias de datos en el aula* [Citizenship education and data science in the classroom] [Video]. YouTube. <https://www.youtube.com/watch?v=wFAFDiCZuhU>
- Century, J., & Cassata, A. (2016). Implementation research: Finding common ground on what, how, why, where, and who. *Review of Research in Education*, 40(1), 169–215. <https://doi.org/10.3102/0091732X16665332>
- Confrey, J., Castro-Filho, J., & Wilhelm, J. (2000). Implementation research as a means to link systemic reform and applied psychology in mathematics education. *Educational Psychologist*, 35(3), 179–191. https://doi.org/10.1207/S15326985EP3503_4
- Levin, B. (2013). To know is not enough: Research knowledge and its use. *Review of Education*, 1(1), 2–31. <https://doi.org/10.1002/rev3.3001>
- Makar, K., Fry, K., & English, L. (2023). Primary students' learning about citizenship through data science. *ZDM – Mathematics Education*, 55(5), 967–979. <https://doi.org/10.1007/s11858-022-01450-7>
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.
- Secretaría de Educación Pública. (2022). *Plan de estudio para la educación preescolar, primaria y secundaria* [Curriculum for preschool, primary and secondary education]. Gobierno de México.