

Project Adelante: An Anti-deficit Professional Development Program for University Mathematics Instructors

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Keywords: antideficit perspective, professional development, community engagement

In this report, we share the design of a year-long professional development program for university math instructors that we developed and refined as the Anti-deficit Learning and Teaching Project (Adelante). The program is a community learning project wherein minoritized students, STEM peer mentors, and math instructors (graduate students and instructional faculty) build relationships as they share their knowledge and experiences with race, gender, and mathematics. *Culturally relevant pedagogy* (Ladson-Billing, 1995) frames the goals of the community learning in terms of deep mathematical knowledge, cultural knowledge, and sociopolitical consciousness. The program activities are inspired by the *Funds of Knowledge for Teaching* project (Moll et al., 1992) wherein teachers are offered opportunities to build meaningful relationships with students and their communities.

An anti-deficit perspective (Adiredja et al., 2020) guides the learning experience for all participants. Not only are minoritized students assumed to have cultural and intellectual assets for learning, but the project also aims to dismantle *deficit master narratives* (Solórzano & Yosso, 2002) about these students and their capacity to learn. Instructors worked on explicitly challenging deficit narratives about their students as they engaged in the program's activities. The project also takes an anti-deficit approach to instructor development, focusing on their individual growth and agency, joy in teaching, and mental health. We also position ourselves as learners to the experience and wisdom of the staff and students at the university cultural centers.

The core activities for the PD engage teachers to: (a) participate in five PD meetings on anti-deficit teaching and Inquiry Based Learning (IBL) teaching method; (b) lead a five-day math summer bridge workshop in Pre-Calculus, Calculus I, II, Vector Calculus, or Linear Algebra immediately following the meetings; (c) participate in critical conversations about race and gender in STEM with students at the cultural centers; (d) conduct a semi-structure interview with one of their students from the summer workshop about their STEM experience; and (e) participate in group reflection meetings debriefing their experience in the activities.

Preliminary analysis of two of the three cohorts of participants found that most instructors developed a more humanizing approach to their teaching and their students (Gutiérrez, 2018). IBL helped instructors to explicitly challenge deficit narratives about minoritized students in the classroom, wherein most observed their students engaging in deep mathematical reasoning. Interviewing one of their students also shifted deficit narratives that developed in the classroom for some instructors. The workshop served as a space to try out previously learned teaching ideas (student centered teaching) without constraints from curriculum and assessments. Doing so reinvigorated many instructors' passion for teaching, especially those who are more experienced.

Acknowledgments

This material is based upon work supported by the National Science Foundation under Grant No. DUE-2021313. Any opinions, findings, and conclusions, or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

References

- Adiredja, A. P., Bélanger-Rioux, R., & Zandieh, M. (2020). Everyday examples from students: An anti-deficit approach in the classroom. *PRIMUS: Problems, Resources, and Issues in Mathematics Undergraduate Studies*, 30(5), 520-538.
<https://doi.org/10.1080/10511970.2019.1608609>
- Gutiérrez, R. (2018). The need to rehumanize mathematics. In I. M. Goffney & R. Gutiérrez (Eds.), *Rehumanizing mathematics for Black, Indigenous, and Latinx students*. Annual Perspectives in Mathematics Education. Reston, VA: National Council of Teachers of Mathematics, Inc.
- Ladson-Billings, G. (1995). Toward a Theory of Culturally Relevant Pedagogy. *American Educational Research Journal*, 32(3), 465–491. <https://doi.org/10.2307/1163320>
- Moll, L. C., Amanti, C., Neff, D., & González, N. (1992). Funds of knowledge for teaching: Using a qualitative approach to connect homes and classrooms. *Theory into Practice*, 21(2), 132-141. <https://doi.org/10.1080/00405849209543534>
- Solórzano, D.G., & Yosso, T. J. (2002). Critical race methodology: Counter-storytelling as an analytic framework for education research. *Qualitative Inquiry*, 8(23), 23-44.
<https://doi.org/10.1177/107780040200800103>