

# Developmental Mathematics Reform: Analyzing Experiences with Corequisite College Algebra at an Urban Community College

Jennifer Zakotnik-Gutierrez  
University of Northern Colorado

*Roughly half of the nearly 44% community college students referred to developmental mathematics never make it into, let alone through, the college-level mathematics courses required for their academic major. The disproportionate number of these students who are from underrepresented groups combined with the low success rates has prompted many community colleges to undertake developmental mathematics reform. The purpose of this study is to provide a multi-perspective account of one community college's program redesign using Gutiérrez's equity framework, Tinto's model of persistence, and activity theory to analyze and interpret the experiences of students, instructors, and administrators.*

**Key Words:** Developmental Mathematics, Corequisite Support, Activity Theory, Equity

Through an institutional equity initiative in 2013, Lowry Community College (LCC, a pseudonym) discovered that their African-American students had a much lower rate of degree completion or transfer within three years of first enrollment than all other groups at the college. Furthermore, African-Americans were disproportionately represented in developmental mathematics, not succeeding in developmental mathematics, and underrepresented in college algebra. The initiative not only led to a targeted goal of increased student success for African-American students but brought to light the struggles of many of LCC's developmental mathematics students similar to the published research (e.g., Bailey, Smith Jaggars, & Jenkins, 2015). The equity initiative provided the impetus for LCC's developmental mathematics reform.

Following the recommendations of Bailey et al. (2015) and Complete College America, LCC implemented a newly-designed college algebra course incorporating a corequisite model of support to replace the previous sequence of developmental mathematics courses leading to calculus. In this model, developmental mathematics content is taught in service to the college algebra content, first during an intensive 5-week on-boarding class at the beginning of the semester, and then as a separate, mandatory corequisite course that meets either directly before or directly after the college algebra class during the remaining 10 weeks of the semester. The course was first implemented in the Fall 2018 semester.

This study adopts the theoretical perspectives of activity theory (Engeström, 1987), Tinto's (1975, 2006) model of persistence, and Gutiérrez's (2009) equity framework to provide an account of the experiences resulting from the course redesign. In activity theory, individual and collective experiences can be characterized through goal-directed activity systems, allowing the interpretation of interactions between and within systems (Engeström, 1987). Students, instructors, and administrators form distinct activity systems with components informed by the constructs of equity and persistence, which also indicate contradictions as drivers of change within and between systems.

Preliminary results of the initial data analysis will be discussed.

## References

- Bailey, T., Smith Jaggars, S., & Jenkins, D. (2015). *Redesigning america's community colleges: A clearer path to student success*. Cambridge, Massachusetts; London, England: Harvard University Press.
- Engeström, Y. (1987). *Learning by expanding: An activity theory approach to developmental research* (1st ed.). Helsinki: Orienta-Konsultit.
- Gutiérrez, R. (2009). Framing equity: Helping students "play the game" and "change the game". *Teaching for Excellence and Equity in Mathematics*, 1(1), 4-7.
- Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research*, 45(1), 89-125. doi:10.3102/00346543045001089
- Tinto, V. (2006). Research and practice of student retention: What next? *Journal of College Student Retention*, 8(1), 1-19. doi:10.2190/4YNU-4TMB-22DJ-AN4W