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Gregory A. Downing, Ph.D.

Academic Background

Ph.D. Learning and Teaching in STEM - Mathematics and Statistics Education
North Carolina State University; Raleigh, NC (2019)

Dissertation: Leveraging Culturally Relevant Pedagogy in a College Algebra Course: A Mixed Methods Study
Committee: Drs. Karen Hollebrands (chair), Lee V. Stiff, Karen Keene, and Jessica DeCuir-Gunby

M.S. Mathematics, North Carolina Central University; Durham, NC (2015)

Thesis: Methods for Calculating the Drazin Generalized Inverse

Committee: Drs. James M. Shoaf (chair), Sung-Sik Kwon, Frederick Johnson, and Hayk Melikyan

M.A. Teaching - Secondary Mathematics Education, Duke University; Durham, NC (2013)

B.A. Mathematics; Sociology; Music (minor), University of North Carolina at Chapel Hill (2012)

University Experience

Assistant Professor, North Carolina Central University, Durham, NC
Department of Curriculum and Instruction (8/2019 – present)

Mathematics Adjunct Professor, Meredith College, Raleigh, NC
Department of Mathematics and Computer Science (2/2019 – 5/2019)

Mathematics Adjunct Professor, North Carolina Central University, Durham, NC
Department of Mathematics and Physics (8/2017 – 5/2019)

Mathematics Education Instructor, North Carolina State University, Raleigh, NC
Department of STEM Education (8/2016 – 5/2019)

K-12 Teaching Experience

University Supervisor, North Carolina State University, Raleigh, NC
College of Education; Department of STEM Education (8/2016 – 5/2019)

Summer and Saturday Academy Instructor, Durham Public Schools; Durham, NC (11/2013 - 7/2016)

High School Mathematics Teacher, Durham Public Schools
Northern High School; Durham, NC (8/2013 - 7/2016)

Honors, Awards, and Recognitions

Outstanding Dissertation Award Winner (North Carolina State University) (4/2020)
STaR (Service, Teaching, and Research) Fellow, Association of Mathematics Teacher Educators (2/2020)
Norman Anderson - J. Conrad Glass, Jr. Graduate Fellowship, NC State, College of Education, 1/2018 to 5/2018
Gates Millennium Graduate Fellowship, Bill and Melinda Gates Foundation; 7/2012 to 7/2019
Robert Noyce Fellowship, Duke University; 7/2012 to 6/2013
Burroughs Wellcome STEM Teacher Scholarship, UNC Chapel Hill; 8/2011 to 5/2012
Gates Millennium Scholarship, Bill and Melinda Gates Foundation; 8/2008 to 5/2012

Grant Activity

PI **Gregory Downing**. Leadership institute for future teachers (LIFT) e-mentor project. (August 2020 – August 2021). Funding Agency: Burroughs Wellcome Fund. The purpose of this grant is to help diversify the teacher pipeline and lead educational equity initiatives in North Carolina. Specifically, the grant will support an educator e-mentoring program for future teachers of color and bilingual teachers participating in the NC State University College of Education Leadership Internship for Future Teachers (LIFT), a year-long invitational program that introduces, prepares, and supports academically competitive high school seniors of color and bilingual high school seniors entering the field of education. **Awarded: \$10,000.**

Co PIs: Freda Hicks, **Gregory Downing**, Megan Lyons, Nigel Pierce, Kia Eason. Rural Resident Teaching Institute (2020). Funding Agency Name: US Department of Education. The goal of North Carolina Central University's Rural Resident Teaching Institute (RRTI) is to decrease the teaching shortage in rural districts, districts with high quality teacher candidates with a focus on recruiting minority candidates that will be invested in the community. Amount Requested: \$2,438,003. **Not Funded.**

Peer-Reviewed Journal Articles

Downing, G. & McCoy, W. (In Press). So, when I'm doing math, now I'm thinking of these real-world situations": Side-effects from exploring mathematics of the sociopolitical through culturally relevant pedagogy in a college algebra course. *Journal of Urban Mathematics Education*.

Downing, G. (Accepted with Revisions). Let me say it for the folk in the back, GOOD TEACHING ISN'T GOOD ENOUGH: Quantifying academic achievement in a college algebra course centered on CRP. *Emerging Voices in Education*.

Downing, G. (Accepted with Revisions). Students' understanding of trigonometric functions: A case study. *Emerging Voices in Education*.

Downing, G., Black, B. (Submitted and Under Review). Examining preservice mathematics teachers' perceptions of social justice content.

Downing, G. (in progress) Using culture as a tool in mathematics.

Downing, G. (in progress) Culturally relevant pedagogy: Bridging the past and the future.

Refereed Conference Proceedings

Downing, G. (2020). Investigating the effects of culturally relevant pedagogy on college algebra students' attitudes towards mathematics. *Proceeding of the 23rd Annual Conference on Research in Undergraduate Mathematics Education*. Boston, MA: Boston University.

Downing, G., Black, B. (2020). Measuring the effectiveness of social justice pedagogy on K-8 preservice teachers. *Proceeding of the 23rd Annual Conference on Research in Undergraduate Mathematics Education*. Boston, MA: Boston University.

Downing, G., Black, B., & McCoy, W. (2019). Examining the effectiveness of culturally relevant lessons within the context of a college algebra course. *Proceeding of the 22nd Annual Conference on Research in Undergraduate Mathematics Education*. Oklahoma City, OK: University of Oklahoma.

Downing, G., Keene, K., & Outlaw, B. (2019). Students' understanding of trigonometric functions in an active-learning course. *Proceeding of the 22nd Annual Conference on Research in Undergraduate Mathematics Education*. Oklahoma City, OK: University of Oklahoma.

Downing, G., Keene, K., & Outlaw, B. (2018). Students' reactions to team activities in a large-scale precalculus class: A mixed methods study. *Proceedings of the 40th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. Greenville, SC.

Outlaw, B., **Downing, G.**, & Keene, K. (2018). Students' experiences in an undergraduate mathematics class: Case studies from a learner-centered precalculus class. *Proceedings of the 40th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. Greenville, SC.

- Outlaw, B. & **Downing, G.** (2018). Students experiences in an undergraduate mathematics class: Case studies from one student-centered precalculus course. *Proceeding of the 21st Annual Conference on Research in Undergraduate Mathematics Education*. San Diego, CA: University of California.
- Downing, G.** & Outlaw, B. (2018). Exploring the role of active learning in a large-scale precalculus class. *Proceeding of the 21st Annual Conference on Research in Undergraduate Mathematics Education*. San Diego, CA: University of California.
- Black, B., **Downing, G.** (2018). An examination of preservice mathematics teachers using ratios and proportions in a social justice context. *Proceeding of the 22nd Annual Conference on Research in Undergraduate Mathematics Education*. San Diego, CA: University of California.
- Downing, G.**, Smith, E., & Black, B. (2017). Preservice teachers' view on social justice topics in the classroom. *Proceedings of the 39th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. Indianapolis, IN.
- Keene, K., Skrzypek, L., **Downing, G.**, & Kott, B. (2017). Bringing evidenced-based practices to a large-scale precalculus class: Preliminary results. *In Proceedings of the 20th Annual Conference on Research in Undergraduate Mathematics Education*. San Diego, CA: University of California.

Invited Presentations

- Downing, G.** (2020 July). *Implications for practice: Applying Education research to our shared disciplinary work*. Invited guest speaker. Research in Undergraduate Mathematics Education (RUME) Invited Paper Session. Math Fest 2020, Philadelphia, PA. [Invited Speaker]
- Downing, G.** (2019, November). *Teaching using culture: Unpacking culturally relevant pedagogy and culturally responsive teaching*. Course guest speaker, Course: Teaching to Transform Society, University of North Carolina at Chapel Hill, NC [Invited Presentation]
- Downing, G.** (2019, October). *The intentionality of teaching mathematics with culture: Success and Obstacles*. Colloquium presentation, Grad Table Talks, North Carolina State University, Raleigh, NC [Invited Presentation]

Refereed National/International Presentations

- Downing, G.** (2020, February). Investigating the effects of culturally relevant pedagogy on college algebra students' attitudes towards mathematics. Research in Undergraduate Mathematics (RUME), Boston, MA. (Research Presentation)
- Downing, G.**, Black, B. (2020, February). Measuring the effectiveness of social justice pedagogy on K-8 preservice teachers. Research in Undergraduate Mathematics (RUME), Boston, MA. (Research Presentation)
- Downing, G.**, Black, B., & McCoy, W. (2019, March). Examining the effectiveness of culturally relevant lessons within the context of a college algebra course. Research in Undergraduate Mathematics (RUME), Oklahoma City, OK. (Poster Presentation)
- Downing, G.**, Keene, K., & Outlaw, B. (2019, March). Students' understanding of trigonometric functions in an active learning course. Research in Undergraduate Mathematics (RUME), Oklahoma City, OK. (Poster Presentation)
- Downing, G.**, Keene, K., Outlaw, B. (2018, November). Students' reactions to team activities in a large-scale precalculus class: A mixed methods study. North American Chapter of the International Group for the Psychology of Mathematics (PME-NA), Greenville, SC. (Research Presentation)
- Outlaw, B., **Downing, G.**, Keene, K. (2018, November). Students' experiences in an undergraduate mathematics class: Case studies from a learner-centered precalculus class. North American Chapter of the International Group for the Psychology of Mathematics (PME-NA), Greenville, SC. (Research Presentation)
- Downing, G.**, Black, B., & Smith, E. (2018, April). Teaching mathematics for social justice. American Educational Research Association (AERA), New York, NY. (Research Presentation)

Downing, G. & Outlaw, B. (2018, February). Exploring the role of active learning in a large-scale precalculus class. Research in Undergraduate Mathematics Education (RUME), San Diego, CA. (Poster Presentation)

Black, B. & **Downing, G.** (2018, February). An examination of preservice mathematics teachers using ratios and proportions in a social justice context. Research in Undergraduate Mathematics (RUME), San Diego, CA. (Poster Presentation)

Outlaw, B. & **Downing, G.** (2018, February). Students experiences in an undergraduate mathematics class: Case studies from one student-centered precalculus course. Research in Undergraduate Mathematics (RUME), San Diego, CA. (Poster Presentation)

Downing, G.; Smith, E.; & Black, B. (2017, November). Preservice teachers' view on social justice topics in the classroom. North American Chapter of the International Group for the Psychology of Mathematics (PME-NA), Indianapolis, IN. (Poster Presentation)

Keene, K., **Downing, G.**, & Kott, B., (2017, February). Bringing evidenced-based practices to a large-scale precalculus class: Preliminary results. Research in Undergraduate Mathematics (RUME). San Diego, CA. (Poster Presentation)

State/Regional/Local Presentations

Black, B., **Downing, G.** (2018, October). An examination of preservice mathematics teachers using ratios and proportions in a social justice context. Institute on Teaching and Mentoring (ITM), Arlington, VA. (Poster Presentation)

Smith, E.; **Downing, G.**; & Black, B. (2017, November). Teaching mathematics for social justice. North Carolina Council of Teacher of Mathematics – Central Regional Conference Collaboration (NCCTM), Greensboro, NC. (Seminar)

Schloss, S. & **Downing, G.** (2017, July). Making co-teaching teamwork meaningful. Triangle High Five Math Summit, Raleigh, NC. (Seminar)

Service to Professional Societies

Reviewer, *Mathematics Teacher Education* journal (2020)

Reviewer, *Investigation of Mathematics Learning* journal (2020)

Reviewer, Research in Undergraduate Mathematics Education Conference (2018 – present)

Reviewer, American Educational Research Association Conference (2018)

Reviewer, North American Chapter of Psychology of Mathematics Education Conference (2018)

Service to the Department, College, and University

Taskstream Steering Committee (2019 – present)

Faculty Senate Alternate (2019 – present)

School of Education Assessment Coordinator (2019 – present)

Licensure & Certification

Teaching License; Professional D-Level Licensure; Mathematics 9-12, North Carolina State Board of Education; Department of Public Instruction 7/2016 (Active)

Professional Memberships

American Educational Research Association (AERA)

Association of Mathematics Teacher Educators - NC (AMTE)
Golden Key International Honour Society
Kappa Delta Pi, International Education Honor Society in Education
Mathematical Association of America (MAA)
North Carolina Council of Teachers of Mathematics (NCCTM)
National Council of Teachers of Mathematics (NCTM)
Psychology of Mathematics Education - North America Chapter (PME-NA)