ROBIN KETURAH ANDERSON

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ACADEMIC APPOINTMENTS

North Carolina State University 2019-Present
Assistant Professor, Mathematics Education

EDUCATION

Ph.D. Stanford University, Graduate School of Education 2019
Curriculum and Teacher Education: Mathematics Education
Learning Sciences and Technology Design
Committee: Professors Jo Boaler (Advisor), Brigid Barron, & Peter Williamson

M.Ed. University of California, San Diego 2008
Credentials: Secondary Mathematics, Physics

B.A. University of California, San Diego 2006
Major: Mathematics

RESEARCH INTERESTS

Anti-Racist Teaching, Mathematics Education, Professional Development, Pre-Service Teacher Preparation, Informal Learning, Curriculum, Social Media, Computational Methods in Social Science Research

PUBLICATIONS

Journal Publications

Anderson, R. K., Donaldson, S., Troudt, M. L., & Baker, C. K. (Under Review). Noticing and Wondering to Develop as Anti-Racist Mathematics Teacher Educators: A Framework for Collaborative Change.

Anderson, R. K., West, H., & Kates, A. (R&R). Propelling moments: What pushes mathematics teachers to request support online?

Anderson, R. K., Ruef, J., Reigh, E., Chavez, R.; Williamson, P, & Villa III, A. M. (In Press). "Math is so much more.": The design, implementation, and outcomes of an elective mathematics methods course. Journal: *Teacher Education Quarterly*

Anderson, R.K, Baker, C.K., Donaldson, S., Troudt, M. L. (2020). Pursuing anti-racist practice through collaborative noticing and wondering. *AMTE Connections*. *30*(2). Retrieved from https://amte.net/connections/winter-2020

Boaler, J., **Anderson, R.** (2018). Considering the rights of learners in classrooms: The Importance of mistakes and growth assessment practices. *Democracy and Education,* 26(2), Article 7.

Anderson, R. K., Boaler, J., & Dieckmann, J. (2018). Achieving elusive teacher change through challenging myths about learning: A blended approach. *Education Sciences*. *8*(3), 98. doi: 10.3390/educsci8030098
Media Coverage: Education Week, Quartz, San Jose Mercury News

Borko, H., Carlson, J., Mangram, C., **Anderson, R. K.,** Fong, A. Million, S., Mozenter, S., & Villa III, A. M. (2017). Design-Based implementation research: Adapting a professional development leadership model with a school district. *International Journal of STEM Education. 4*(29). doi: 10.1186/s40594-017-0090-3

Anderson, R. (2016). When copy machine collaboration is not enough: Building a collaborative online professional network. *New England Mathematics Journal*. 49(1), 57-64.

Edited Books

Hollebrands, K., **Anderson, R. K.**, Oliver, K. (eds.) (In Press). Online learning in mathematics education. Springer

Refereed Conference Proceedings

Carman, L., & **Anderson, R. K.** (Forthcoming, 2021). Developing an antiracist stance amongst pre-service secondary math teachers: What course resources impacted perceptions of mathematics learning? Intended conference presentation and proceeding: North American Chapter of the International Group for the Psychology of Mathematics Education, Philadelphia, 2021.

West, H., **Anderson, R. K.,** & Kates, A. (2020). Collaborative learning within an informal community: How online spaces can catalyze change. In A.I. Sacristán, J.C. Cortés-Zavala & P.M. Ruiz-Arias, (Eds.). *Mathematics Education Across Cultures: Proceedings of the 42nd Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Mexico* (pp. 1941-1945). Cinvestav /AMIUTEM / PME-NA. https:/doi.org/10.51272/pmena.42.2020

Anderson, R. K. (2020). Social media facilitated collaboration: An analysis of in-the-moment support in a mathematics education facebook group. In *Proceedings of the International Commission on Mathematical Instruction Study 25, Teachers of Mathematics Working and Learning in Collaborative Groups.* Lisbon, Portugal: University of Lisbon. February 3-7, 2020; Pg. 581-588.

Anderson, R. (2019). Networked professional development: An ecological perspective on mathematics teacher learning. *Proceedings of the forty-first annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education.* St Louis, MO: University of Missouri. November 14-17, 2019; Pg. 525-529.

Anderson, R. K. (2018). Beyond copy room collaboration: A case study of online informal teacher professional learning. *Proceedings of The 13th International Conference of the Learning Sciences*, June 23-27, 2018; London England. Pg. 1511-1512.

Book Chapters

Skultety, L., Joswick, C., Troudt, M. L., & **Anderson R. K.** (Accepted). Interrogating map projections: A justice-oriented geometry lesson. In Conway, B., Id-Deen, L., Raygoza, M. C., Ruiz, A., Staley, J. W., & Thanheiser, E. (Eds.), *Middle School Mathematics Lessons to Explore, Understand and Respond to Social Injustice.*

Monzenter, S., & **Anderson, R. K.** (Accepted). Scale as a tool to investigate the impacts of civil war: A unit to mathematically read *A Long Walk to Water*. In Greathouse, P., Anthony, H., & Eisenbach B. (Eds.), *Developing Mathematics Literacy through Young Adult Novels.* Rowman and Littlefield.

Anderson, R. K., Troudt M. L., Joswick, C., & Skultety, L. (Accepted). Simulating success based on societal odds: A unit to mathematically read *The Hunger Games*. In Greathouse, P., Anthony, H., & Eisenbach B. (Eds.), *Developing Mathematics Literacy through Young Adult Novels.* Rowman and Littlefield.

Baker, C.K., Troudt, M. L., Donaldson, S., & **Anderson, R. K.** (Accepted) Becoming together: Interrogating anti-racism in teacher education through critical self-study. Proposed book chapter in Antiracist Teacher Education: Theory and Practice Association of Teacher Education.

Opinion Articles

Anderson, R. K. (2019). Unlearning deficit language together: A productive blueprint for supporting change. *Ed Week*. December 11, 2019; Pg. 20.

Working Papers

Anderson, R. K. (In preparation). Social media knowledge reservoirs: Online communities as conduits and repositories for the expertise of practicing mathematics teachers.

Anderson, R.K., & Williams, M. (In preparation). How we learn: Teachers personal experiences learning in social media.

McKie, K., **Anderson, R. K**. (In preparation). Considering complexity in mathematics teacher learning: How centering the teacher provides a humanizing theoretical stance.

RESEARCH EXPERIENCE

Design and Pitch Challenges in STEM: Merging Entrepreneurship and Mathematics Learning August 2021 -
Funding: NSF ITEST ($ 1,424,834.00)
Co-Principal Investigator | North Carolina State University

Collaborators: Co-PI Erin Krupa, Michael Belcher, North Carolina State University

To compete in a continually changing and increasingly technology-focused career landscape, students will need a deep, conceptual, and applied understanding of science, technology, engineering, and mathematics (STEM). Yet, many students, especially students from underrepresented populations, perceive STEM to be disconnected from their interests and career aspirations. New curricular approaches are needed, especially

in mathematics, that increase students' career interest and engagement in STEM, while also supporting the learning of rich and targeted STEM content. In this project, researchers will develop and investigate nine design challenges built within a novel curricular framework for high school mathematics, the Design and Pitch Challenges in STEM. The Design and Pitch Challenges framework leverages entrepreneurial pitch competitions to support rich mathematics learning. Students work collaboratively to 1) build, test, and refine prototype STEM products; 2) design business plans to demonstrate product viability; and 3) pitch their products to a panel of judges. To support implementation, researchers will also build and investigate an online professional learning network for teachers. This project will work to rehumanize the learning experience for high school students by bringing relevant topics to their mathematics curriculum. Some of these design challenges will be intentionally created to address social injustice in students' local communities.

Virtual Webinars as Instances of Intentional Teacher Professional Learning 2020 - Present
Principal Investigator | North Carolina State University

Collaborators: Leigh Nataro, Amber Thienel, Marissa Grayson, Facilitators, Global Math Department; Luke Carman, graduate student, North Carolina State University; Kelly Boles, graduate student, Stanford University.

With the intention to continually center mathematics teachers within research about teacher learning, in 2020 I started a research-practice partnership with the Global Mathematics Department. The research team consists of members of the GMDs planning board, Luke, a graduate student in my lab, and a Stanford University colleague who is also interested in informal teacher learning. The project is currently in the data collection phase using surveys and interviews. The webinars will also be analyzed using topic modeling (a computational method) to investigate the knowledge topics that teachers are presenting on within these bi-weekly, free webinars.

Developing an Anti-Racist Stance in an Introductory Mathematics Education Course 2020 - Present
Principal Investigator | North Carolina State University

Collaborators: Luke Carman, graduate student, North Carolina State University

This project started as a course redesign of EMS 204: Introduction to Mathematics Education during the summer of 2020. The course redesign changed the focus of the course from a broad survey of mathematics education to intentionally focusing on developing anti-racist mathematics teachers. As this is the first course in the math education sequence, the course redesign still honored the survey aspect of the course, but grounded course components in a anti-racist framework. This project takes a design-based research approach and is planned to iterate through the offerings of EMS 204 in the 2021-2022 school year. The goal of this project is to rehumanize mathematics classrooms through understanding the impact of different anit-racist course activities on pre-service teachers' conception of mathematics teaching and learning.

Becoming an Anti-Racist Mathematics Teacher Educator 2020 - Present
Co-Principal Investigator | North Carolina State University

Collaborators: Sara Donaldson, Wheaton College (MA); Melissa Troudt, University of Wisconsin - Eau Claire; Courtney Baker, George Mason University

This project started as a research interest group within the AMTE STaR Fellowship focused on understanding research on anti-racist teaching practices. It has grown into a multi-university research project that uses self-study and case-study methodologies to analyze the impact of intentional anti-racist professional development for mathematics teacher educators (MTE). The goal of the project is to rehumanize mathematics education by systematically documenting the change process of MTEs and producing professional development resources for other MTEs. This collaboration will continue by seeking more funding to develop professional development materials.

Where do Mathematics Teachers Choose to Learn?: Examining Professional Learning within an Informal, Community-Based Mathematics Teacher Collaborative 2020 - Present
Funding: FRPD NCSU Internal Award ($5,000)

Principal Investigator | North Carolina State University

Collaborators: Kim Johnson, facilitator, Triangle Math Teachers' Circle; Luke Carman, graduate student, North Carolina State University

Through an FRPD award, I have spent the 2020-2021 school year embedded within the local Triangle Math Teachers' Circle and employed ethnographic data collection methods. The group meets once a month, during meetings I am a participant-observer and take detailed field notes. I also have recruited teachers to participate in surveys and interviews about their learning experiences within the Circle. This project is currently in the data collection phase and analysis will begin in the summer of 2021. The goal of this project is to rehumanize professional development by documenting informal teacher learning that centers the desired experiences of practicing teachers.

Twenty-First Century Teacher Learning: Online Learning Communities as Critical Components of Mathematics Teacher Professional Development 2017 - Present
Principal Investigator | North Carolina State University

Collaborators: Sebastian Munoz-Najar Galvez, Harvard University; Kelly McKie, University of Ottawa; Martia Williams, undergraduate student, North Carolina State University; Latoya Brewer, graduate student, North Carolina State University

This project started as my dissertation research within one Facebook group of mathematics teachers. I conducted a reanalysis of the data with graduate students at NC State during the 2019-2020 school year to examine how teachers use social media to learn about advocating for detracking, an anti-racist practice. This year I am working with a data scientist from Harvard to use advanced computational methods to investigate how knowledge is co-constructed in these spaces. I also am writing a theory paper with a graduate student from University of Ottawa that uses a complexity theory approach to teacher learning. This approach centers the lived experiences of the teacher within a complex learning system. Finally, I am continuing reanalysis of the data with an

undergraduate and graduate student this year to find instances of teachers brokering information as experts of teaching mathematics. All of these projects aim to rehumanize teacher learning by investigating teachers' self-directed learning within social media.

Research on the Impact of an Elective Curriculum and Instruction Course 2017 - 2019
Research Assistant | Stanford University | PI: Dr. Peter Williamson

Research on the Impact of a Hybrid Teacher Professional Development Model 2016 - 2019
Research Assistant | Stanford University | PI: Dr. Jo Boaler

Research on Undergraduate Educational Pathways 2017 - 2018
Research Assistant | Stanford University | PI: Brian Cook

Research on Mathematics Teacher Leadership Preparation 2015 - 2016
Research Assistant | Stanford University | PIs: Dr. Hilda Borko and Dr. Janet Carlson

TEACHING EXPERIENCE

Post-Secondary Teaching Experience

Interactions in the Mathematics Classroom, graduate-masters, NCSU 2021
Seminar on STEM Teacher Professional Development, graduate-PhD, NCSU 2020
Introduction to Mathematics Education, undergraduate, NCSU 2019-2020
Teaching Mathematics with Technology, graduate-masters, NCSU 2019-2020
Curriculum and Instruction for Mathematics III, graduate-masters, Stanford University 2017-2018
Curriculum and Instruction for Mathematics II, graduate-masters, Stanford University 2018
Curriculum and Instruction Elective in Math, graduate-masters, Stanford University 2018

Secondary Teaching Experience

Mathematics and Physics Teacher – Guajome Park Academy (Public K-12 School) 2007 - 2015

Professional Development Experience

Hollyhock Teacher Fellowship - Stanford University 2016, 2018
How to Learn Math for Teachers (Online Course) - Stanford University Online 2016
Problem-Solving Cycle – Stanford University 2015 - 2016

CONFERENCE PRESENTATIONS AND INVITED TALKS

West, H., **Anderson, R. K.,** & Kates, A. Collaborative learning within an informal community: How online spaces can catalyze change. Psychology of Mathematics Education - North America, *Sinelo, Mexico.* 2021 (June)

Anderson, R. K. Social media facilitated collaboration: An analysis of in-the-moment support in a mathematics education facebook group. International Commission on Mathematical Instruction Study 25, Teachers of Mathematics Working and Learning in Collaborative Groups*. Lisbon, Portugal.* 2020

Anderson, R. Networked professional development: An ecological perspective on mathematics teacher learning. Psychology of Mathematics Education - North America 2019

Conference, *St. Louis, Mo.*

Anderson, R., & Chavez, R**.** Rehearsing ways to practice creative insubordination with Pre-Service Teachers. Paper in Symposium: Political Conocimiento for Teaching Mathematics: Context Matters. Chair: Rochelle Gutierrez**.** American Mathematics Teacher Educators (AMTE) Annual Meeting**,** *Orlando, FL.* 2019

Williamson, P., **Anderson, R.**, Reigh, E., & Lange, K. Re-imagining pre-service teacher education: Teaching and learning across disciplinary lines. American Education Research Association (AERA) Annual meeting**,** *Toronto, Canada.* 2019

Anderson, R., & Chavez, R**.** Engaging in political conversations around mathematics: Rehearsing ways to practice creative insubordination with pre-service teachers. So, What Are You Working On? Conference**,** *Stanford, CA.* 2018

Boaler, J., **Anderson, R.,** & Fieldstien, S. The creation and development of mathematical mindset coaching tools: A partnership between Youcubed at Stanford University and Tulare County. National Council of Supervisors of Mathematics (NCSM) National Conference,. *Washington, D.C.* 2018

Lang, D., **Anderson, R.,** & Lee, M. Teacher professional development: Social networks and influence maximization. BayLAN, *Berkeley, CA.* 2017

Anderson, R., & Dieckmann, J. Researching the impact of an online course designed to transform student engagement and achievement in mathematics. TELOS: Technology for Equity in Learning Opportunities**,** *Stanford, CA.* 2017

GRANTS

NSF ITEST ($1,424,834.00) Aug 2021 -
Design and Pitch Challenges in STEM: Merging Entrepreneurship and Mathematics Learning

Faculty Research and Professional Development Grant ($5,000) 2020-2021
Research grant to study local mathematics teacher collaborative

STEM Education Initiative Grant ($9,749) 2019
Funding for course (Teaching Mathematics with Technology) redesign

VPGE SCORE: Strengthening the Core – Academic Innovation Grant ($15,000) 2018-2019
Research grant to study an innovative curriculum and instruction course. (with Peter Williamson)

Technology for Equity in Learning Opportunities Research Grant ($100,000) 2016-2018
Research grant to study the implementation of hybrid teacher professional development (with Jo Boaler)

HONORS AND AWARDS

AMTE STaR Fellowship 2020-2021

Service, Teaching, and Research (STaR) in Mathematics Education Fellow, Sponsored by Association of Mathematics Teacher Educators (AMTE) [only 30 mathematics teacher educators selected per year in the United States

Noyce Master Teacher Fellowship 2012 – 2015
Curriculum development, new teacher mentoring, networking, professional development

PROFESSIONAL TRAINING

Computational Social Science Certificate. Stanford University
Technology-Enhanced Teaching Certificate. Stanford University

ACADEMIC LEADERSHIP & SERVICE

Social Media Committee Member (AMTE) 2021 - Present

Dissertation Advisor (NCSU), Jonathan Lopes Torres (Co-advisor) Luke Carman (Co-advisor) 2019 - Present

Dissertation Committee Member (NCSU), Emily Elrod, Heather Barker, James Smiling, Latoya Brewer, Charles Johnson 2019 - Present

Reviewer, *Education Sciences, AMTE, PME-NA, MTE, AERA Open, Democracy & Education* 2017 – Present

Panel Reviewer, NSF 2021

Facilitator & Mentor, Mathematics Education Research Group, Stanford University 2017 - 2019

Founding Member & Facilitator**,** Computational Text Analysis for Social Sciences, Stanford University 2017 - 2019

MEDIA MENTIONS

"Best way to improve student math scores? Change teachers' attitudes, study says" *San Jose Mercury News,* August 5, 2018
https://www.mercurynews.com/2018/08/05/best-way-to-improve-student-math-scores-change-teachers-attitudes-study-says/

"To Up Students' Math Ability, Try Working on Their Teachers' Growth Mindset" *Education Week,* July 19, 2018
https://blogs.edweek.org/teachers/teaching_now/2018/07/up_students_math_ability_teachers_growth_mindset.html

"Stanford research shows that students do better on tests when teachers face down their math demons" *Quartz,* July 12, 2018
https://qz.com/1326592/stanford-research-shows-that-students-do-better-on-tests-when-elementary-school-teachers-face-down-their-own-math-demons/

PROFESSIONAL AFFILIATIONS

American Educational Research Association (AERA)
Association of Mathematics Teacher Educators (AMTE)
International Society of the Learning Sciences (ISLS)
National Council of Teachers of Mathematics (NCTM)
TODOS: Mathematics for All (TODOS)