

Ruby L. Ellis

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Academic Background

- 2018 **Ph.D., Mathematics Education**
Auburn University
Dissertation title: *An Exploratory Study of the Impact of Situated Professional Development for Integrating Technology in Mathematics Instruction on Pedagogical Beliefs and Teaching Practices of Secondary Mathematics Teachers in a School with a High African American, Low-Income Student Population*
- 2012 **Ed. S., Mathematics Education**
The University of Alabama at Birmingham
Thesis title: *Equal ACCESS: Leveling the Mathematics Playing Field with Online Education*
- 2009 **M.Ed., Mathematics Education**
Alabama State University
- 2003 **B.S. Mathematics; B.S. High School Education**
The University of Alabama at Birmingham

Professional Work Experience

- July 2021 - present **North Carolina State University**
Assistant Professor of Mathematics Education
Department of Science, Technology, Engineering, and Mathematics Education
- August 2019 – June 2021 **University of Missouri**
Postdoctoral Research Fellow
Department of Learning, Teaching, and Curriculum, Mathematics Education
- May 2019 – August 2019 **Auburn University**
Consultant, Robert Noyce Capacity Building Proposal
Department of Curriculum and Teaching, Mathematics Education
- January 2019 – May 2019 **Auburn University**
Postdoctoral Research Fellow
Department of Curriculum and Teaching, Mathematics Education
- 2014 – 2018 **Auburn University**
Graduate Teaching and Research Assistant

- 2015 - 2016 Department of Curriculum and Teaching, Mathematics Education
Auburn University
 Graduate Teaching and Research Assistant
 Department of Curriculum and Teaching, Science Education
- 2013 - 2014 **Talladega City Schools (Alabama)**
 Secondary Mathematics Teacher, Talladega High School
- 2013 **Talladega College**
 Mathematics Instructor
- 2010 – 2013 **Pell City Schools (Alabama)**
 Secondary Mathematics Teacher, Pell City High School
- 2005 - 2010 **Tarrant City Schools (Alabama)**
 Secondary Mathematics Teacher, Tarrant High School
- 2003 - 2005 **Birmingham City Schools (Alabama)**
 Secondary Mathematics Teacher, Hudson K - 8 School

Certifications and Licenses

- 2013 Alabama Class AA, Secondary (36A)
 Grade Level: 6 – 12
 Mathematics (015)
 EXP: 2025
- 2009 Alabama Class A, Secondary (06A)
 Grade Level: 6 – 12
 Mathematics (015)
 EXP: 2025
- 2004 Alabama Class B, Secondary (16A)
 Grade Level: 6 – 12
 Mathematics (015)
 EXP: 2025

Instruction and Advising

University of Missouri

Instructor of Record

- LTC 4310 – Learning and Teaching Geometry in the Elementary School (Spring 2020)
 LTC 4360/4571 – Intro. Teaching Mathematics in Middle and Secondary Schools (Fall 2020)
 LTC 8875 – Technology in Mathematics Education (Online, Fall 2020)
 LTC 4310 – Learning and Teaching Geometry in the Elementary School (Spring 2021)
 LTC 8900 – Graduate Seminar – Race in Mathematics Education (Spring 2021)
 LTC 8866 – Contemporary Equity Issues in Mathematics Education (Spring 2021)

Auburn University

Instructor of Record

CTSE 4923 – Internship in Secondary Mathematics (Spring 2015, Fall 2015, Spring 2016, Fall 2016, Spring 2017, Fall 2017, Spring 2018, Fall 2018).

CTSE 5040 – Technology and Applications in Secondary Mathematics Education (Fall 2016)

Co-Instructor

CTSE 4030 – Curriculum and Teaching in Secondary Mathematics Education (Fall 2014)

CTSE 5040 – Technology and Applications in Secondary Mathematics Education (Fall 2014)

CTMD 4010 – Teaching Mathematics: Middle School (Spring 2015, Spring 2016)

Talladega College

MATH 101 – Introduction to College Mathematics (Fall 2013)

Honors and Citations

2018	Holmes Scholar of the Month, February
2017	Outstanding Graduate Student of the Year, Department of Curriculum & Teaching, Auburn University
2013	Outstanding Education Specialist Student of the Year, The University of Alabama at Birmingham, School of Education
2010	Claes Nobel Educator of Distinction
2009	Tarrant Pinson Valley Rotary Teacher of the Year
2009	Tarrant High School Teacher of the Year
2008	Meritorious Service Award, Tarrant City Schools
2002	National Society of Collegiate Scholars
2001	Phi Kappa Phi
2001	Golden Key National Honor Society
2001	Kappa Delta Pi

Scholarships

2018	AMTE Susan Gay Graduate Student Conference Travel Scholarship
2016	Alma Holladay Graduate Award

Fellowships

2014	Albert H. Collins Fellowship
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Assistantships

2014 - 2018	Graduate Teaching and Research Assistant Auburn University Department of Curriculum and Teaching, Mathematics Education
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2015 – 2016 **Graduate Research Assistant**
Auburn University
Department of Curriculum and Teaching, Science Education

Publications

- Otten, S. Ellis, R. Han, J. & de Araujo. (Accepted). Comparing motivations for flipped instruction to data on flipped implementations in Algebra. Proceedings of the forty-third annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education. Philadelphia, PA.
- Parrish, C., & Ellis, R. (Accepted). Developing procedural fluency through mixed review. *New Teacher Advocate*.
- Ellis, R., Han, J., de Araujo, Z., & Otten, S. (2020). Reviewing the literature on flipped mathematics instruction: A qualitative meta-analysis. Proceedings of the forty-second annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education. Mazatlán, Sinaloa, México: Cinvestav-Department of Mathematics Education and Mexican Association on the Use of Technology in Mathematics Education.
- Mangram, C., Junor-Clarke, P., Walker, P., Ellis, R., & Castro-Minnehan, C. (2020). Focus on improving clinical experiences in secondary mathematics teacher preparation. In W. G. Martin, B. R. Lawler, A. E. Lischka, W. M. Smith (Eds.), *The mathematics teacher education partnership: The power of a networked improvement community to transform secondary mathematics teacher preparation (pp.)*. Charlotte, NC: Information Age Publishing.
- Mangram, C., Conway, B., Struchens, M., Ellis, R., & Erickson, D. (2019). Paired-Placement Internships: Clinical Teaching Becomes A Collaborative and Empowering Model for Ongoing Professional Development. Proceedings of the eighth annual Mathematics Teacher Education Partnership conference. Washington, DC: Association of Public and Land-grant Universities.
- Parrish, C., Ellis, R., Martin, W. (2019). Connecting research to teaching: Improving mathematics discourse through action research. *Mathematics Teacher*, 112(4), 302-307.
- Struchens, M. E., Sears, R., Whitfield, J., Biagetti, S., Brosnan, P., Oloff-Lewis, J., Clarke, P. A., Stone, J. J., Erickson, D. R., Parrish, C., Conway IV, B. M., & Ellis, R. L. (2019). Implementation of paired placement and co-planning/co-teaching field experience models across multiple contexts. In T. Hodges, & A. Baum (Eds.), *Handbook of research on field-based teacher education* (pp. 32-63). Hershey, PA: IGI Global. doi:10.4018/978-1-5225-6249-8.ch002

Manuscripts in Progress

Ellis, R. & Strutchens, M. (under review). The Impact of an Action Based Technology Situated Teacher Professional Learning Project on African American Students' Opportunities to Reason Mathematically

Ellis, R. (In progress). Shifting reluctant teachers' instructional practices and beliefs through situated professional development

de Araujo, Z., Otten, S., Han, J., & Ellis, R. (in progress). Literature review of flipped instruction in mathematics. Target journal JRME

Professional Presentations (*invited)

National & International

Ellis, R. (2021, May). Using situated professional development to impact teachers' beliefs, practices, and technology use. Presented at the 2020 National Council of Teachers of Mathematics Annual Meeting and Exposition, St. Louis, MO (date shifted to 2021 due to covid).

Ellis, R., Han, J., de Araujo, Z., & Otten, S. (2021, June) Reviewing the literature on flipped mathematics instruction: A qualitative meta-analysis. Presented at the Forty-second Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Mazatlán, Sinaloa, México.

Strutchens, M., Mangram, C., Conway, B., Ellis, R., Erickson, D. (2019, July). Paired placement internships: Clinical teaching becomes a collaborative and empowering model for ongoing professional development. Presented at The Eighth Annual MTE-Partnership Conference: Transformation, Equity, Leadership, St. Louis, MO.

Ellis, R., Naidau, M., Walker, B. (2019, February). *Bright ideas for affiliates 2*. Webinar hosted by the National Council of Teachers of Mathematics Membership and Affiliate Relations Committee.

Funderburk, J., Ellis, R., Naidau, M., Walker, B. (2018, November). *Bright ideas for affiliates 1*. Webinar hosted by the National Council of Teachers of Mathematics Membership and Affiliate Relations Committee.

Ellis, R. (2018, July). *NCTM Affiliate Bright Spots*. Presented at the National Council of Teachers of Mathematics Affiliate Leaders Conference, Indianapolis, IN.

Strutchens, M., Whitfield, J., Erickson, D., Conway, B., Parrish, C., & Ellis, R. (2018, June). *Paired-Placement Internships: A Collaborative and Empowering Model for Clinical Teaching*. Presented at The Seventh Annual MTE-Partnership Conference: Equity, Transformation, Leadership, Denver, CO.

Russell, M., Thomas, M., Laurencio, D., Taylor, A., Ellis, R., Dixon, C. (2017, January). *Promoting persistence in STEM graduate degree programs for traditionally underrepresented students in STEM*. Presented at the Ethnographic and Qualitative Research Conference, Las Vegas, NV.

Ellis, R., & Parrish, C. (2016, November). *Mathematical Discourse and Questioning: Connecting Research to Practice*. Presented at the 2016 National Council of Teachers of Mathematics Regional Conference, Philadelphia, PA.

Russell, M., Ellis, R. (2016, April). *Promoting equity in science teaching through transformative professional development in rural Alabama*. Presented at the 2016 National Association for Research in Science Teaching (NARST) International Conference, Baltimore, MD.

State and Local

*Ellis, R. (2020, April). The Bridge Research Discussion: Confronting unproductive beliefs and supporting productive practices in the secondary mathematics classroom. Presented at University of Missouri, Columbia, MO.

*Ellis, R. (2019, December). *Technology resources. Pre-service teacher roundtable discussion*. Presented at the Missouri Council of Teachers of Mathematics Conference, Columbia, MO.

*Ellis, R. (2019, December). *Panelist. Pre-service teacher panel discussion*. Presented at the Missouri Council of Teachers of Mathematics Conference, Columbia, MO.

Ellis, R. (2018, June). *Middle school content and pedagogy session: Ratios and proportional reasoning*. Presented at the Transforming East Alabama Mathematics and Alabama Mathematics, Science, and Technology Initiative Professional Mathematics Learning Community 2018 Summer Academy, Auburn, AL.

Ellis, R. (2018, January). *Middle school content and pedagogy session: Proportional Reasoning*. Presented at the Transforming East Alabama Mathematics and Alabama Mathematics, Science, and Technology Initiative Professional Mathematics Learning Community January Quarterly Meeting, Auburn, AL.

Ellis, R. (2017, June). *Middle school content and pedagogy session: Samples and Populations*. Presented at the Transforming East Alabama Mathematics and Alabama Mathematics, Science, and Technology Initiative Professional Mathematics Learning Community 2017 Summer Academy, Auburn, AL.

Ellis, R., Eiland, A. (2015, December). *NCTM regional conference highlights*. Presented at the Auburn University STEM Education Seminar, Auburn, AL.

Parrish, C., & Ellis, R. (2015, October). *Discourse and questioning in the mathematics classroom: Connecting research to practice*. Feature Power Session at Alabama Council of Teachers of Mathematics (ACTM) Annual Fall Forum, Birmingham, AL.

Ellis, R., Parrish, C., East, L., Horn, T., McCall, A., Wells, J. & Johnson, R. (2014, April). *PRISM: Practical resources in mathematics education*. Presented at the 2014 East Alabama Council of Teachers of Mathematics Spring Conference, Opelika, AL.

Parrish, C., Ellis, R., East, L., Horn, T., McCall, A., Wells, J. & Johnson, R. (2014, April). *Historical significance of the Alabama college and career readiness standards and the mathematical practice standards*. Presented at the 2014 East Alabama Council of Teachers of Mathematics Spring Conference, Opelika, AL.

Research Projects

Participation With Grants

Years	Project	Description
Under Review	Collaborative Research: Preparing to Teach Mathematics with Technology: LEAding Productive Mathematics Discussions with Web-Based Dynamic Geometry Tools (PTMT: LEAD DG)	National Science Foundation IUSE, Karen Hollebrands (PI), NCSU, Ruby Ellis (Co-PI) , NCSU, Gemma Mojica (Co-PI), NCSU Status: Pending \$2,634,619
2019 - 2021	Examining Relationships Between Flipped Instruction and Students' Learning of Mathematics	National Science Foundation Discovery Research K-12. Zandra de Araujo (PI), University of Missouri, James Tarr (Co-PI), University of Missouri, Ze Wang (Co-PI), University of Missouri, Samuel Otten (Co-PI), University of Missouri, Award ID: 1721025. (Served as a Postdoctoral Research Fellow.)
2018 - 2019	Collaborative Research: Teacher Leadership: Investigating the Persistence and Trajectories of Noyce Master Teaching Fellows	National Science Foundation Robert Noyce Scholarship. Wendy Smith (PI), University of Nebraska, Award ID: 1758462. The purpose of this project is to learn about mathematics and science teachers' leadership trajectories and the factors that may have influenced those trajectories. (Served as a graduate assistant on the grant until December 2018. Served as a Postdoctoral Research Fellow from January 2019 until August 2019)
2017 - 2019	Collaborative Research: Attaining Excellence in Secondary Mathematics	National Science Foundation Improving Undergraduate STEM Education (IUSE) Grant. Marilyn Strutchens (PI), Auburn

	Clinical Experiences with a Lens on Equity	<p>University, Award Id: 172699; Ruthmae Sears, University of South Florida, Award Id: 1726362; & Howard Gobstein, APLU, Award Id: 1726853. This project will implement an improvement science study to address the following question: How does a continuum of collaborative and student-focused clinical experiences, including co-planning/co-teaching and paired placement fieldwork models, impact pre-service teachers' implementation of equitable teaching practices across multiple institutional contexts?</p> <p>(Served as a graduate assistant on the grant until December 2018. Served as a Postdoctoral Research Fellow from January 2019 until August 2019.)</p>
2015 - 2018	STEM Enrichment in Physics, Mathematics and Project based Learning: Meeting K-12 Needs in Alabama	<p>The purpose of this project is to provide a comprehensive series of professional development (PD) activities for K-12 teachers to address the serious needs, particularly in high-needs school districts, for enhanced curriculum materials and training in Physics, Mathematics (grades 6-12), and Project-Based Learning. We will provide this PD along three different fronts utilizing expertise from Auburn faculty and staff while coordinating directly with both Alabama Math Science and Technology Initiative (AMSTI) and Alabama Science in Motion (ASIM) personnel, including the AU directors of both units.</p> <p>(Served as a graduate assistant on the grant and professional development provided.)</p>
2015 - 2016	Math and Science Partnership (MSP) Qualitative Research for NanoBio Science Partnership for the Alabama Black Belt Region	<p>The purpose of this project is to increase science achievement increase the science achievement and interest levels for middle school students in the Alabama Black Belt region, reduce gaps in the performance in science among various ethnic, socioeconomic, and gender subgroups, improve the knowledge and performance of in-service teachers through intensive professional development, and recruit highly motivated minority students, including</p>

		community college graduates, to become certified science teachers. (Served as a graduate assistant on the grant.)
2014 - 2015	TEAM-Math and AMSTI Professional Learning Communities	The purpose of the project is to establish professional learning communities (PLCs) to provide collaborative and sustained professional development for teachers in targeted K-12 schools in East Alabama. The immediate focus of the professional development is the Alabama College and Career Ready Standards, especially the Standards of Mathematical Practice. (Served as a graduate assistant on the grant and professional development provided.)
2014	Auburn University Mathematics Teacher Education Partnership Hub Grant from the Hemsley Charitable Trust	The Mathematics Teacher Education (MTE) Partnership is a national partnership of universities and K–12 districts with the goal of ensuring that secondary mathematics teacher candidates are prepared to meet the requirements of CCSS. (Served as a graduate assistant on the grant.)

Professional Public Service

National

2020 – 2023	Association of Mathematics Teacher Educators (AMTE), Professional Development Committee Member
2020	North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA), Equity and Justice Strand Leader for PME-NA 42
2019	North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA), Volunteer PME-NA 41
2016 - 2019	National Council of Teachers of Mathematics (NCTM), Membership and Affiliate Relations Committee
2015	National Council of Teachers of Mathematics (NCTM), Regional Conference Volunteer

State and Local

2017 - 2018	Leaders in Training Mentor, Pick Elementary School
2013 - 2014	School Improvement Committee, Talladega City Schools
2011 - 2013	Mathematics Curriculum Development Team, Pell City School System
2007 - 2010	Mathematics Department Chair, Tarrant City Schools
2007 - 2010	New Teacher Mentor, Tarrant City Schools
2007 - 2010	Building Leadership Team, Tarrant City Schools

2006 - 2010 Vanguard Technology Team, Tarrant City Schools
2004 - 2005 Building Based Student Support Team, Husdon K-8 School

Organization Memberships

National

American Association of Colleges for Teacher Education
Association of Mathematics Teacher Educators
Benjamin Banneker Association
Holmes Scholar Alumnae Association
National Council of Teachers of Mathematics
North American Chapter of the International Group for the Psychology of Mathematics Education

State and Local

Alabama Council of Teachers of Mathematics
Association of Mathematics Teacher Educators Alabama
Missouri Council of Teachers of Mathematics

Professional Growth and Early Career Opportunities

Community for Advancing Discovery Research in Education (CADRE) Postdoc
Professional Growth Opportunity (2020 Cohort)
American Association of Colleges for Teacher Education (AACTE) Holmes Scholars
(2015 Cohort, Auburn University)
Preparing Future Faculty (2015 – 2016 Cohort, Auburn University)