

SEAN GRUBER

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Research Concentration

- Exploring student-centered (i.e., active learning) versus traditional classroom norms/practices within undergraduate math classrooms.
- Drawing connections between classroom norms/practices and students' achievement and self-efficacy in their undergraduate math courses.
- Analyzing the relationship between classroom norms/practices and students' intentions to major in a STEM field.
- Analysis of student success in relation to math placement exam data.

Teaching Goals

- Implement student-centered instructional practices to advance student achievement, self-efficacy, and career/study intentions within STEM fields.
- Use student-centered practices to encourage all students, especially those traditionally underrepresented in STEM fields, to engage with mathematics with confidence and conceptual understanding.
- Utilize technology inside and outside the classroom to support students' exploration of mathematical concepts.

Education

Ph.D.
2017 - 2022
University of Maryland,
College Park (UMCP)

Ph.D. in Mathematics Education, Department
of Teaching and Learning, Policy and
Leadership (TLPL)
GPA: 3.846

M.Ed.
2013 - 2014
UMCP

Integrated Master's Certificate Program
(IMCP) in Curriculum and Instruction;
Successful completion of the edTPA for
Maryland teacher certification
GPA: 4.000

B.S.
2009 - 2013
UMCP

Bachelor's Degree in Secondary Education &
Mathematics (Double Major) with Honors in
Education
GPA: 3.903 - High Honors

Workplace Experience

July 2023 - Present

Lecturer, University of Maryland, College Park

Courses taught:

- Math115: Precalculus (including Freshmen Connection)
- Math120: Calculus I (for non-STEM intending majors)
- Math141: Calculus II (for STEM-intending majors)
- Math310: Introduction to Mathematical Proof

July 2022 - July 23

Visiting Assistant Professor, Johns Hopkins University

- Lead instructor for Calculus I and Calculus II for biological and social science majors.
- Managed 18 discussion sections run by ten Teaching Assistants and eight Course Assistants.
- Assisted in providing a STEM education lens on the recent redesign of entry-level courses.
- Assisted the Math Department in developing logistic regression models to analyze trends in students' Math Placement Exam results and their performance in their first college math class (presented poster at RUME 2023 Conference in Omaha, Nebraska).
- Served as the Departmental representative at the College Board's Higher Education Symposium on AP Precalculus.

Summer Session
2014-21, 23

UMCP Academic Achievement Programs (AAP), Summer Transitional Program (STP)

- Taught preparatory/support courses for Developmental Mathematics, Discrete Mathematics, College Algebra, and Pre-Calculus to low-income and first-generation, incoming freshman students.

Summer Session
2021

Math Instructor for the AAP STEM Bootcamp

- Provided instruction during a three-day program in which students applied their understanding of trigonometric functions to program LED light patterns.

Fall 2014 -
Spring 2017

High School Mathematics Teacher, Watkins Mill High School (an International Baccalaureate School in Montgomery County Public Schools)

- Taught Algebra 1, Honors Algebra 2, and Honors Pre-Calculus.
- Worked with 120 students from diverse backgrounds, including students with IEP/504 plans.
- Received training in Common Core State Standards for Algebra 1 and Honors Pre-Calculus.
- Attended training in Tampa, Florida from the Florida Association of World IB Schools.
- Participated in Sheltered Instruction Observation Protocol

training, addressing the needs of students who are English Language Learners.

Fall 2015 -
Spring 2017

My Favorite Math Tutor; Tutoring Services

-Tutored middle and high school students taking Algebra 1, Honors Algebra 2, Honors Precalculus, Statistics, and Calculus in Montgomery County Public Schools

Summer Session
2012

UMCP College of Letters and Sciences, Scholastic Transition Educational Program (STEP) Tutor

-Tutored incoming freshmen in mathematics, including student-athletes, to prepare them for introductory math courses offered through UMCP.

Other Roles

September, 2023 -
Present

University System of Maryland (USM) Consultant

I, along with several other faculty from other universities around the state of Maryland, serve on the group that advises the University System of Maryland (USM) to decide how, if at all, newly-proposed high school math courses satisfy the state requirements for math credits. The review of these courses help encourage different math pathways for students to pursue depending on their background with mathematics and future career interests.

August, 2023;
January, 2024/25

Winter Math Workshop Instructor

I ran three, free Workshop (via Zoom) sessions during the winter break specifically designed for students scheduled to take/retake Math113/013 or Math115/015 in the spring. I review key math concepts students need (but maybe forgot) for Math113/115, preview math content students will learn, and help reduce any anxiety students may experience surrounding mathematics. Students also engage with student facilitators consisting of students who successfully completed Math115. This Workshop has taken place twice thus far, in January of 2024 and 2025. I also served as a consultant for the first iteration of this workshop that occurred during the summer of 2023.

Fall, 2017 -
Spring, 2022

UMCP Center for Mathematics Education (CfME) Graduate Assistant

-Contributed two articles to the seasonal newsletter reviewing the work of two faculty members, Dr. Lawrence Clark and Dr. Janet Walkoe.

-Managed lending and updating of CfME library collection.

Courses taught in Math Department:

- Math213: Elements of Geometry and Measurement
- Math312: Mathematical Reasoning and Proof for Pre-Service Middle School Teachers

Fall, 2017 -
Spring, 2018

UMCP Supervisor for MCERT Student Intern

- Observed and evaluated a student in her fifth year of the Master's Certification Program for teaching offered at UMCP.
- Assisted intern in developing lesson planning, classroom management, and collaboration skills with other professionals within a high school math department.
- Facilitated extensive conversations between the intern and her mentor regarding the intern's progress over the course of the academic year.

Scholarly Work

Papers Accepted for Publication:

- Gruber, S., & Rosca, R. (2024). Sustaining active learning in undergraduate precalculus: Results and challenges of a course redesign. *Problems, Resources, and Issues in Mathematics Undergraduate Studies (PRIMUS)*, 1–15. <https://doi.org/10.1080/10511970.2024.2369980>
- Gruber, S., Rosca, R. I., Chazan, D., Fleming, E., Balady, S., VanNetta, C., Okoudjou, K. (2020). Active learning in an undergraduate precalculus course: Insights from a course redesign. *Problems, Resources, and Issues in Mathematics Undergraduate Studies (PRIMUS)*, 31(3–5), 358–370. <https://doi.org/10.1080/10511970.2020.1772920>

Dissertation:

- Gruber, S. (2022). Exploring the classroom norms of an undergraduate precalculus course and their relationship with students' self-efficacy, achievement, and STEM intentions: A convergent mixed-methods study (A. Brantlinger, Ed.) [Ph.D., University of Maryland, College Park]. <https://www.proquest.com/openview/1b1ceb3d33dd0ff0e62e47c595f234c9/1?pq-origsite=gscholar&cbl=18750&diss=y>

Conference Presentations/Posters:

- Gruber, S., Braley, E., & Brown, R. (February, 2023). *Math placement and academic achievement: An internal analysis*. Poster for the Research in Undergraduate Mathematics Education (RUME) Conference, Omaha, Nebraska.
- Gruber (January, 2023). *Exploring the classroom norms of an undergraduate precalculus course*. Presentation at the Joint Mathematics Meeting (JMM), Boston, Massachusetts.
- Gruber, S. (May, 2022). *Exploring the classroom norms of a redesigned precalculus course: Findings on supporting achievement, self-efficacy, and STEM intentions*. Interactive presentation at the Change in Departments and

Institutions via Active Learning (Change DIAL) Hybrid Conference, Lincoln, Nebraska.

- Gruber, S., & Rosca, R. (January, 2020). *Active learning in an undergraduate precalculus course: Insights from a course redesign*. Presentation at the Joint Mathematics Meeting, Denver, Colorado.
- Gruber, S., & Brantlinger, A. (April, 2019). *Shifts in perspectives of NYC teaching fellows: Exploring reformed and traditional math beliefs and practices*. Roundtable paper presented at the American Educational Research Association (AERA) Annual Conference, Toronto, Canada.
- Gruber, S., & Brantlinger, A. (April, 2020). *What is effective math teaching? Shifts in beliefs and practices of NYC teachers*. Roundtable paper presented at the American Educational Research Association (AERA) Annual Conference, San Francisco, CA.
- Gruber, S., & Brantlinger, A. (2021). *Shifting beliefs and instructional practices: A mixed-methods study of alternatively certified New York City teachers*. Roundtable paper accepted to the annual American Educational Research Association (AERA) Conference. Virtual Conference, United States. → Currently working on a paper submission for the Journal for Research in Mathematics Education.

Research Projects, Grants, and Internally Supported Projects:

- Co-Chair of the Fundamental Studies Math (FSM) Success Initiative (2024-Present)
 - Funding - The Office of the Provost
 - Focus - The Fundamental Studies Math Success Initiative represents a concerted effort to improve student outcomes and experiences in UMD FSM courses. By addressing key challenges and implementing targeted activities, the initiative aims to create a more supportive and successful learning environment for undergraduate students taking FSM courses at UMD. Such learning environments are crucial, in particular, to support those students traditionally underrepresented in STEM fields of study.
 - My role - Along with Dr. Lawrence Clark (Assistant Dean, Office of Undergraduate Studies), I help oversee the team charged by the Provost in improving the performance outcomes of students enrolled in undergraduate math courses. More specifically, Dr. Clark and I submitted the final proposal (attached) to the Provost to utilize University resources in supporting a series of activities aimed at improving the experience and outcomes of undergraduate students taking fundamental math courses through the Math Department. We routinely meet with the team members involved in each of the activities (see proposal for more specifics), track student improvement, support instructors of the courses of interest, and connect stakeholders across campus to move the work forward.
- Refining Mathematics Instruction through Student Feedback (2024-Present)
 - Funding - TLTC Teaching Innovation Grant
 - Focus - This project supports the development of a new mobile application called Engauge which, succinctly, is aimed at making large lectures more engaging.

- My role - Serve as a faculty liaison between the PIs on this project and faculty participating in the project (i.e., using the Engauge app), in addition to being a faculty participant myself.
- Student Engagement in Mathematics through an Institutional Network for Active Learning (SEMINAL) Project (2018-2022)
 - Associations - NSF-funded project, initiated by the Association of Public and Land-Grant Universities (APLU).
 - Focus - Implement active learning (i.e., student-centered math instruction) in college-level math classrooms, ranging from Precalculus to Calculus II.
 - My Role - I have taught multiple sections of Precalculus offered by the Math Department at UMCP. I also have collected and analyzed data to measure the academic success of students and their attitudes toward math. Additionally, I attended several days of planning sessions (during the summer of 2018) with fellow instructors and the course coordinator to redesign the syllabus to prioritize active-learning strategies over the semester. This planning also included aligning syllabi across different sections/versions of the course. Lastly, I filmed a series of videos to support Precalculus students during the COVID-19 pandemic and beyond.
- New York City Teaching Fellows (NYCTF) Research Group (2018-2021)
 - Associations - Working under Dr. Andrew Brantlinger (my advisor), an Associate Professor at UMCP under the Department of Teaching and Learning, Policy and Leadership.
 - Focus - Analyzed various characteristics of the NYCTF alternative certification program, including retention rates and teaching practices of graduates.
 - My Role - I am currently researching what factors influence the formation of Fellows' teaching practices and beliefs. I am the lead author on a paper we will be submitting to the Journal for Research in Mathematics Education for potential publication.
- The Adaptive Learning in Statistics (ALiS) Project (2017)
 - Associations - Ithaca S+R, Transforming Post-Secondary Education (TPSE) in Mathematics, and the Urban Institute
 - Focus - Worked to improve student academic success in introductory statistics courses through the use of student-centered instruction and adaptive courseware known as Acrobatiq.
 - My Role - I was a data liaison on the project. My responsibilities included de-identifying and organizing student survey data.

Educational Honors

2017 - 2022	Fey-Graeber Fellow, University of Maryland, College Park (assistantships and fellowship funds for 5 years of full-time doctoral study)
2012 - 2014	Robert Noyce Teacher Scholarship Program (2-time recipient), University of Maryland, College Park
2011 - 2013	College of Education Honors Program - Honors Thesis on Universal Design for Learning (UDL)

References

Dr. Andrew Brantlinger - Associate Professor in the Department of Teaching and Learning, Policy and Leadership; University of Maryland, College Park

Relationship: Ph.D. Advisor

Phone Number: (773) 960-3398

Email: amb@umd.edu

Dr. Chris Rasmussen - Professor, Department of Mathematics and Statistics; San Diego State University

Relationship: Primary Investigator (PI) on SEMINAL Project

Phone Number: (619) 594-1584

Email: crasmussen@sdsu.edu

Dr. Raluca Rosca - Mathematics Department Lecturer; University of Maryland, College Park

Relationship: Math115 Precalculus Course Coordinator at UMCP

Phone Number: (301) 405-9811

Email: rarosca@umd.edu

Dr. Angela Stoltz - College of Education Assistant Clinical Faculty; University of Maryland, College Park

Relationship: Summer Transitional Program (STP) Colleague; Professional Development Coordinator of MCERT Program

Phone Number: (410) 443-6516

Email: astoltz@umd.edu

Dr. Richard Brown - Director of Undergraduate Studies, Teaching Professor, Mathematics Department, Johns Hopkins University

Relationship: Oversees all undergraduate math courses

Phone Number: (410) 516-8179

Email: richardbrown@jhu.edu

*Other references available upon request