

(1) Research, Publication, Grants or Other Funded Research Activities

Publications

1. **[Proceeding]** Chamberlain Jr., D., McGuinness, P., Faulconer, E., & Wood, B. (pending acceptance, Feb 2024). Using Trees to See a Forest: Leveraging Machine Learning to Classify Student Thinking. Proceedings of the 26th Annual Conference on Research in Undergraduate Mathematics Education: SIGMAA on RUME, Omaha, NE.
2. **[Book Chapter]** Reed, Z. & Chamberlain Jr., D. (abstract submitted Mar 2023, accepted for chapter submission Jul 2023, chapter submission Nov 2023). A Framework for Analyzing Asynchronous Discussion Activities. Teaching and Learning Mathematics Online 2e, CRC Press, FL.
3. **[Journal]** Chamberlain Jr., D. (2023). How one instructor can teach a large-scale, mastery-based College Algebra course online. Problems, Resources, and Issues in Mathematics Undergraduate Studies. DOI: <https://doi.org/10.1080/10511970.2023.2190183>.
4. **[Proceeding]** Chamberlain Jr., D., Reed, Z., & Keene, K. (2023, Feb 23-25). Adapting the Argumentative Knowledge Construction Framework to Asynchronous Mathematical Discussions. Proceedings of the 25th Annual Conference on Research in Undergraduate Mathematics Education: SIGMAA on RUME, Omaha, NE.
5. **[Journal]** Faulconer, E., Chamberlain Jr., D., & Wood, B. (2022). A Case Study of Community of Inquiry Presences and Cognitive Load in Asynchronous Online STEM Courses. Online Learning Journal. DOI: <http://dx.doi.org/10.24059/olj.v26i3.3386>.
6. **[Proceeding]** Bailey, T., Chamberlain Jr., D., & Christodouloupoulou, K. (2022, Feb 24-26). Undergraduate's covariational reasoning across function representations. Proceedings of the 24th Annual Conference on Research in Undergraduate Mathematics Education: SIGMAA on RUME, Boston, MA. URL: <http://sigmaa.maa.org/rume/RUME24.pdf>.
7. **[Proceeding]** Reed, Z., Chamberlain Jr., D., & Keene, K. (2022, Feb 24-26). Argumentative knowledge construction in asynchronous calculus discussion boards. Proceedings of the 24th Annual Conference on Research in Undergraduate Mathematics Education: SIGMAA on RUME, Boston, MA. URL: <http://sigmaa.maa.org/rume/RUME24.pdf>.
8. **[Journal]** Chamberlain Jr., D. & Vidakovic, D. (2021). Cognitive trajectory of proof by contradiction for Transition-to-Proof students. Journal of Mathematical Behavior. DOI: <https://doi.org/10.1016/j.jmathb.2021.100849>.

Grants

1. **[External Grant]** (Pending Support) Principal Investigator, NSF CAREER Grant: Machine Learning Affordances in Collegiate Mathematics Education Research, 2024-2029. Award amount: \$500,000.
2. **[External Grant]** Principal Investigator, Doenet (NSF DUE-1915294, DUE-1915363, DUE-1915438) Mini-Grant: Asynchronous Discovery Activity - Learning to Fly with the Wind. 2023-2024. Award amount: \$500.
3. **[External Grant]** Co-Principal Investigator, NSF IUSE: Undergraduate Research for Fully Online STEM Students: Impact of Expanded Curricular Options on STEM Attitudes, Identity, & Career Ambitions, with Robert Deters (PI), Emily Faulconer (co-PI), Brent Terwilliger (co-PI). 2023-2026. Award amount: \$382,578.
4. **[External Grant]** Co-Principal Investigator, NSF IUSE: Community of Inquiry and Cognitive Load in Online STEM: Persistence, Performance, and Perspectives, with Emily Faulconer (PI) and Beverly Wood (co-PI). 2021-2024. Award amount: \$233,298.
5. **[Internal Grant]** Principal Investigator, ERAU-W Faculty Seed Grant: Collective Knowledge Progression and Proliferation in Asynchronous Calculus Discussion Boards, with Zackery Reed (co-PI) and Karen Keene (co-PI). 2023. Award amount: \$6,000.
6. **[Internal Grant]** Principal Investigator, ERAU-W Faculty Seed Grant: Developing Autonomous, Targeted Feedback in Precalculus, 2021-2022. Award amount: \$4,069.

(2) Presentation of Scholarly Work

1. **[National]** Chamberlain Jr., D., Faulconer, E., Wood, B. (pending acceptance, Feb 2024). Using Trees to See a Forest: Leveraging Machine Learning to Classify Student Thinking. 26th Annual Conference on Research in Undergraduate Mathematics Education: SIGMAA on RUME, Omaha, NE.
2. **[National]** Chamberlain Jr., D. (2023, Aug 2). Technology Use in Undergraduate Mathematics Classrooms. 2023 MAA MathFest, Tampa, FL.
3. **[Local]** Chamberlain Jr., D. (2023, Mar 29). Predicting Students' Thoughts to Provide Elaborative Feedback. Invited by California State University Bakersfield Mathematics Department Seminar Series.
4. **[National]** Chamberlain Jr., D., Reed, Z., & Keene, K. (2023, Feb 23). Adapting the Argumentative Knowledge Construction Framework to Asynchronous Mathematical Discussions. 25th Annual Conference on Research in Undergraduate Mathematics Education: SIGMAA on RUME, Omaha, NE.
5. **[Regional]** Chamberlain Jr., D., Reed, Z., Rister, A., & Velez, M. (2023, Feb 7). Roundtable discussion: Practical Suggestions to Improve Online Discussions Across Disciplines. 2023 Academic Innovation Virtual Conference hosted by ERAU-W.
6. **[Local]** Faulconer, E., Bourdeau, D., Kiernan, K., & Chamberlain Jr., D. (2023, Jan 21). Non-Traditional Scholarly Publication. Invited by Embry-Riddle Aeronautical University – Worldwide Research Scholars Program.
7. **[Local]** Chamberlain Jr., D. & Faulconer, E. (2022, Apr 21). How We Manage Large-Scale Data Collection. Invited by Embry-Riddle Aeronautical University – Worldwide College of Arts and Sciences Brown Bag Lunch & Learn Series.
8. **[National]** Faulconer, E., Chamberlain Jr., D., & Wood, B. (2022, April 13). Instructional Efficiency in Asynchronous Online Discussions. Online Learning Consortium Innovate Conference, Dallas, TX.
9. **[National]** Paolucci, C., Chamberlain Jr., D., & Vancini, S. (2022, Apr 7). Investigating alternatively-certified teachers' mathematical knowledge for teaching calculus. Joint Mathematics Meeting, Seattle, WA.
10. **[National]** Bailey, T., Chamberlain Jr., D., & Christodouloupoulou, K. (2022, Feb 25). Undergraduate's covariational reasoning across function representations. Proceedings of the 24th Annual Conference on Research in Undergraduate Mathematics Education: SIGMAA on RUME, Boston, MA.
11. **[National]** Reed, Z., Chamberlain Jr., D., & Keene, K. (2022, Feb 24). Argumentative knowledge construction in asynchronous calculus discussion boards. Proceedings of the 24th Annual Conference on Research in Undergraduate Mathematics Education: SIGMAA on RUME, Boston, MA.
12. **[Regional]** Chamberlain Jr., D., Reed, Z., & Keene, K. (2021, Nov 20). Investigating social construction of knowledge during asynchronous discussions. 5th Northeastern Conference on Research in Undergraduate Mathematics Education. New Brunswick, NJ (virtual).

(3) Unfunded Research Activities

(4) Creative Works and Projects

(5) Other Professional Activities, Contributions, and Achievements Indicative of Professional Growth

1. **[Conference Session Organization]** Chamberlain Jr., D. & Barber, R. (2023, Aug 2). Session: Unspoken Research Components. 2023 MAA MathFest, Tampa, FL.
2. **[Conference Session Organization]** Chamberlain Jr., D. & Barber, R. (2023, Aug 2). Session: Building a Research Program. 2023 MAA MathFest, Tampa, FL.
3. **[Workshop Participant]** Developing Online Learning Experiments Using Doenet (2023, May 22-26). NSF funded project (DUE-1915294, DUE-1915363, DUE-1915438) hosted by Institute for Mathematics and its Applications, University of Minnesota.
4. **[Conference Workshop Organization]** Chamberlain Jr., D., Reed, Z., & Keene, K. (2023, Feb 23). Workshop: Research on Technology in Undergraduate Mathematics Education. 25th Annual Conference

- on Research in Undergraduate Mathematics Education: SIGMAA on RUME, Omaha, NE.
5. **[Conference Session Organization]** Chamberlain Jr., D., Acu, B., & Gasiorek, S. (2023, Jan 3). Session: Navigating the Early Years of the Faculty Experience. 2023 Joint Mathematics Meeting, Boston, MA.