TYLER HARPER-GAMPP

Postdoctoral Researcher
Department of STEM Education | College of Education
North Carolina State University

twgampp@ncsu.edu
linktr.ee/tharpergampp

EDUCATION

Ph.D. in Learning and Teaching in STEM, *North Carolina State University* July 2024
Science Education with Minor in Chemistry
Dissertation: *Exploring middle school students' scale cognition and knowledge integration during virtual reality-supported science instruction. (Chairs: Dr. Cesar Delgado & Dr. Karen B. Chen)*

M.A.T. in Secondary Science, *University of North Carolina Wilmington* 2018
Teaching licensure: Science and Mathematics 6-12 (*Texas, Michigan, North Carolina, New Jersey, & Georgia*)

B.S. in Chemistry, *University of North Carolina Wilmington* 2016
Departmental Honors in Chemistry & Minor in Math

PROFESSIONAL EMPLOYMENT

Postdoctoral Researcher From 2024
Department of STEM Education, North Carolina State University

Instructor From 2024
M.S. in Curriculum and Instruction, Western Governors University

Graduate Research Assistant 2021 - 2024
Department of STEM Education, North Carolina State University

Student Teaching Supervisor 2022 - 2023
Department of STEM Education, North Carolina State University

Teaching Assistant 2023
Department of STEM Education, North Carolina State University

Secondary Science Teacher 2019 - 2021
Liberal Arts and Sciences Academy, Austin Independent School District

Secondary Science Teacher 2018 - 2019
Eugene Ashley High School, New Hanover County Schools

Assistant Residence Coordinator 2016 - 2017
Housing and Residence Life, University of North Carolina Wilmington

Graduate Research Assistant 2016 - 2017
Department of Chemistry & Biochemistry, University of North Carolina Wilmington

Ernest F. Hollings Scholar 2014 - 2016
National Oceanic and Atmospheric Association

RESEARCH GRANTS & FUNDING

(1) **Harper-Gampp, T.** Exploring middle school students' scale cognition and knowledge integration during virtual reality-supported science instruction*. NC State University College of Education, Dissertation Support Award.* ($500).

(2) **Harper-Gampp, T.** Virtual reality induces awe but possibly not accommodation. *NC State University College of Education, Global Graduate Presenter.* ($1000).

(3) **Harper-Gampp, T.** Refining a panel of experts validation methodology for instrument development. *Agnes and Garfield Stiff Travel Award*. ($1000).

PUBLICATIONS

A. PEER-REVIEWED JOURNAL ARTICLES

(1) **Harper-Gampp, T.**, Delgado, C., You, H., Peterson, M., & Chen, K. B. (*in press)*. Measuring size and scale: The development and validation of the Assessment of Size and Scale Cognition (ASSC). *Research in Science Education.*

(2) Duffy, P. L.; **Gampp, T.**; Coleman, A. F.; Enneking, K. M.; Tiettmeyer, J. M.; Mazzarone, K. M.; Grove, N. (2019). Form versus function: A comparison of Lewis structure drawing tools and the extraneous cognitive load they induce. *Journal of Chemical Education*, *96*(2), 238-247.

(3) Coleman, A. F.; Balok, R. S.; Tiettmeyer, J. M.; Duffy, P. L.; Mazzarone, K. M.; **Gampp, T.**; & Grove, N. (2017). Unraveling the complexities: An investigation of the factors that induce load in chemistry students constructing Lewis structures. *Journal of Chemical Education*, *94*(3), 282-288.

B. PEER-REVIEWED CONFERENCE PROCEEDINGS

* Presenting author(s)

(1) Chen, K. B.*, **Harper-Gampp, T.**, Wu, L., Delgado, C., & Peterson, M. (2024, September). Learning scale in virtual reality: Experiences and perception of immersive technology at a public middle school. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 67*(1)*.*

(2) Cheng, F.*, **Harper-Gampp, T.**, Planchart, R., Dunning, M., Peterson, M., Delgado, C., & Chen, K. B. (2024, September). Study of graphic armatures, multimodal cues and numeric measures in virtual reality on learners' performance and workload*. Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 67*(1)*.*

(3) **Harper-Gampp, T.,** Delgado, C., Alharbi, K.*, Peterson, M., & Chen, K. B. (2024, July). Does shrinking and growing in VR induce awe among young students? In R. Lindgren, T. Asino, E. A. Kyza, C. Looi, D. T. Keifert, & E. Suárez (Eds.). *Proceedings of the 18th International Conference of the Learning Sciences* (pp. 2447-2448). International Society of the Learning Sciences.

(4) Wu, L.*, Chen, K. B., Sekelsky, B., Peterson, M., **Harper-Gampp, T.**, & Delgado, C. (2023, March). Shrink or grow the kids? Scale cognition in an immersive virtual environment for K-12 summer camp. *2023 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW)* (pp. 721-722). Institute of Electrical and Electronics Engineers.

(5) Delgado, C.*, **Harper-Gampp, T.***, Peterson, M., & Chen, K.B. (2023, June). Virtual reality induces awe but possibly not accommodation. In P. Blikstein, J. Van Aalst, R. Kizito, & K. Brennan (Eds.). (2023). *Proceedings of the 17th International Conference of the Learning Sciences* (pp. 1050-1053). International Society of the Learning Sciences.

(6) Wu, L.*, Sekelsky, B., Peterson, M., **Gampp, T.**, Delgado, C., & Chen, K. B. (2022, October). Immersive virtual environment for scale cognition and learning: Expert-based evaluation for balancing usability versus cognitive theories. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, *66*(1), 1972-1976.

(7) **Gampp, T.***, Delgado, C., Peterson, M., & Chen, K. (2022, June). Embodied cognition in virtual reality to support learning of scale. In C. Chinn, E. Tan, C. Chan, & Y. Kali (Eds.), *Proceedings of the 16th International Conference on the Learning Sciences* (pp. 1900-1902). International Society of the Learning Sciences.

C. BOOK CHAPTERS AND ADDITIONAL PUBLICATIONS

(1) Balok, R. S.; Coleman, A. F.; Enneking, K. M.; **Gampp, T**.; Tiettmeyer, J. M.; Duffy, P. L.; Mazzarone, K. M.; & Grove, N. (2018). Connecting form and function: Understanding the role that cognitive load plays in students' ability to construct representations of chemical structure. In R. Zheng (Eds.), *Cognitive Load Measurement and Application: A Theoretical Framework for Meaningful Research and Practice*. Routledge.

(2) **Gampp, T.**, & Grove, N. (2015). A quantitative classroom: Investigation of cognitive load fluctuations within a chemistry lecture environment. [Honors thesis]. UNC Wilmington Campus Repository.

D. MANUSCRIPTS IN PROGRESS

(1) Peterson, M., Delgado, C., Planchart, R., Kulasingam, R., Wu, L., **Harper-Gampp, T.**, Mathenge, R., Cheng, F., Sekelsky, B., Anderson, A. L., & Chen, K. B. (***under review***). Function mapping: Guidance for multidisciplinary teams in making theoretically grounded design decisions in the development of learning technologies.

(2) **Harper-Gampp, T.**, Delgado, C., Mathenge, R., Kulasingam R., Planchart, R., Wu, L., Peterson, M., & Chen, K. B. (*in preparation*). Using VR to integrate a crosscutting concept with disciplinary core ideas for middle school.

(3) **Harper-Gampp, T.**, & Blanchard, M. R. (*in preparation*). High school students' reflections before and after a university field trip.

(4) **Harper-Gampp, T.**, Delgado, C., Peterson, M., & Chen, K. B. (*in preparation*). Awe in virtual reality.

RESEARCH EXPERIENCE

Postdoctoral Researcher (*Dr. Margaret Blanchard*) From May 2024

Projects:

(1) FuSe: Polymer SWIR Photodiodes for Focal Plane Arrays (*NSF-CHE #2328868*)

(2) Deep Eutectic Solvent Pulping Technology to Reduce Carbon Emission in Pulp and Paper Industry *DE-FOA #0002804*)

(3) Sargassum and Hurricane Waste Biomass for Aviation Fuel and Graphite (*DE-FOA #0002636*)

(4) A Novel Approach to Decarbonizing the Pulp and Paper Industry: Kraft Chemical Recovery via Bipolar Membrane Electrodialysis (*DE-FOA #0002997*)

(5) Eco: Future Eco-Manufacturing of Recyclable Soft Electronics (*NSF-CMMI #2134664*)

- Co-managed the education and workforce development plan for 5 multi-year grants, ensuring compliance with funding requirements, timely reporting, and effective budget utilization.
- Coordinated and facilitated FuSe Fellows program, a mentorship initiative for community college and NC State University students hosted on Saturdays throughout the academic year.
- Planned and implemented campus field trips for rural early college high school students.
- Led the validation of a novel instrument for gauging high school students perceptions of STEM field trips
- Collected and analyzed both qualitative and quantitative data on the impact of educational activities (e.g., field trips) on students' interest in STEM careers

Graduate Research Assistant (*Dr. Margaret Blanchard*) 2023 - 2024

Project: Eco: Future Eco-Manufacturing of Recyclable Soft Electronics *(NSF-CMMI #2134664)*

- Co-developed and managed an online course that engaged rural high school teachers in the eco-manufacturing of soft electronics for classroom use.

Graduate Research Assistant *(Dr. Cesar Delgado)*, North Carolina State University 2021 - 2024

Project: *SCALE-VR: Scale Cognition through Advanced Learning Environments in VR (NSF-DRL #2055680)*

- Co-developed Scale Worlds VR, a virtual environment grounded in scale cognition theory, where students can grow to the size of the Sun, shrink to the size of an atom, and explore all orders of magnitude in-between.
- Researched the impact of instruction incorporating Scale Worlds VR. Led the co-design and implementation, data collection, and analysis of a middle school science unit incorporating Scale Worlds
- Led the development and validation of the Assessment of Size and Scale Cognition, leading to a refined methodology for a panel of expert review.

Graduate Research Assistant *(Dr. Nathaniel Grove)*, UNC Wilmington 2017 - 2018

Project: *Cognitive Load and Representational Competence: The Development of an Adaptive Learning*

System to Assist Students with Structure Creation (NSF-DUE #1610084)

- Developed a rubric based on empirical evidence for assessing the cognitive load associated with various structural features when constructing Lewis structures.
- Created a repository of Lewis structures ranked by degrees of cognitive load to be used in the development of an adaptive learning system.

Ernest F. Hollings Scholar, National Oceanic and Atmospheric Association 2014 - 2016
Appointment: *Port Aransas National Estuarine Research Reserve in Port Aransas, Texas*

- Developed educational datasets and interactive programs for K-12 students aligned with state science standards using Science on a Sphere, a six foot sphere that projects visualizations of planetary data to illustrate Earth system science to learners.

Undergraduate Research Assistant *(Dr. Nathaniel Grove)*, UNC Wilmington 2014 - 2016
Project: *Collaborative Research (BeSocratic): A Free-form, Interactive System to Investigate the Development of Representational Competence (NSF-DUE# 1122661)*

- Developed a physiological measurement methodology for identifying instances of cognitive load during a traditional university lecture.
- Investigated the cognitive load associated with students' construction of Lewis structures using our co-developed web-based tool, traditional online homework systems, and traditional pen and paper.

PRESENTATIONS

* Presenting author(s)

A. RESEARCH CONFERENCE PRESENTATIONS

(1) Salako, T.*, **Harper-Gampp, T.*,** & Blanchard, M. R. (March, 2025). *A qualitative analysis of high school students' reflections before and after a university field trip.* [Paper presentation]. National Association for Research in Science Teaching, National Harbor, MD, United States.

(2) **Harper-Gampp, T.***, Delgado, C.*, Alharbi, K., Peterson, M. & Chen, K. B. (March, 2025). *Unveiling the causes of awe in VR among college students*. [Paper presentation]. National Association for Research in Science Teaching, National Harbor, MD, United States.

(3) **Harper-Gampp, T.*** (2025, January). *Exploring Human Impacts with Scale Worlds VR: Students' Integration of a Crosscutting Concept and Disciplinary Core Ideas*. [Paper presentation]. Association for Science Teacher Education, Long Beach, CA, United States.

(4) **Harper-Gampp, T.***, Delgado, C., Peterson, M., Chen, K. B., Mathenge, R., Planchart, R., Kulasingam, R., & Wu, L. (2024, April). *Scale reasoning in immersive virtual reality: Capturing middle school students' learning*. [Symposium presentation]. American Educational Research Association, Philadelphia, PA, United States.

(5) **Harper-Gampp, T. *** (2024, April). Exploring Middle School Students' Scale Cognition During Virtual Reality-Supported Science Instruction. [Three-minute dissertation presentation]. NC State STEM Education Graduate Symposium, Raleigh, NC, United States.

(6) **Harper-Gampp, T.*** (2024, April). Exploring Middle School Students' Scale Cognition During Virtual Reality-Supported Science Instruction. [Poster presentation]. NC State Graduate Student Research Symposium, Raleigh, NC, United States. (*Awarded 2nd place for the College of Education*)

(7) Estrada, E.*, **Harper-Gampp, T.***, Delgado, C.*, Mathenge, R., Peterson, M., Chen, K. B., & Wu, L. (2024, March). Co-designing a science lesson with VR in middle school science. [Presentation]. *Leveraging embodied cognition using virtual reality in middle school science education*. [Related paper set]. National Association for Research in Science Teaching, Denver, CO, United States.

(8) Delgado, C.*, **Harper-Gampp, T.**, Mathenge, R., Peterson, M., & Chen, K. B. (2024, March). Impact of VR science lesson on students' knowledge of scale. [Presentation]. *Leveraging embodied cognition using virtual reality in middle school science education*. [Related paper set]. National Association for Research in Science Teaching, Denver, CO, United States.

(9) **Harper-Gampp, T.***, Delgado, C., Peterson, M., Chen, K. B., Mathenge, R., Planchart, R., & Kulasingam, R. (2024, March). Student impressions about a VR science lesson. [Presentation]. *Leveraging embodied cognition using virtual reality in middle school science education*. [Related paper set]. National Association for Research in Science Teaching, Denver, CO, United States.

(10) Mathenge, R.*, Kulasingam, R.*, **Harper-Gampp, T.**, Delgado, C., Peterson, M., & Chen, K. B. (2024, March). Impact of an VR science lesson on reformed-oriented nature of science instruction. [Presentation]. *Leveraging embodied cognition using virtual reality in middle school science education*. [Related paper set]. National Association for Research in Science Teaching, Denver, CO, United States.

(11) Diaz, B.* & **Harper-Gampp, T.*** (2024, March). Examining students' general chemistry performance following a voluntary supplemental course. [Paper presentation]. National Association for Research in Science Teaching, Denver, CO, United States.

(12) Wu, L., Sekelsky, B., Peterson, M., **Gampp, T.**, Delgado, C., & Chen, K. B. (2023, October). *Scale Worlds: Iterative refinement, evaluation, and theory-usability balance of an immersive virtual learning environment*. [Poster presentation]. Human Factors and Ergonomics Society, Washington, DC, United States.

(13) **Harper-Gampp, T.***, Delgado, C., Peterson, M., & Chen, K. B. (2023, April). *Refining a panel of experts validation methodology for instrument development*. [Roundtable presentation]. American Education Research Association, Chicago, IL, United States.

(14) **Harper-Gampp, T*.**, Delgado, C., Peterson, M., & Chen, K. B. (2023, April). *Designing and developing an instrument to assess scale cognition*. [Paper presentation]. National Association for Research in Science Teaching, Chicago, IL, United States.

(15) Hakim, K., Bishop, A., Enneking, K.*, Nogle, J., Paulson, E.*, **Gampp, T.***, & Grove, N. (2018, March). *Measuring chemistry students' cognitive load on working memory: The development of an inventory of load inducing topics in chemistry 1.* [Poster presentation]. American Chemical Society, New Orleans, LA, United States.

(16) Duffy, P.*, Coleman, A., **Gampp, T.***, Tiettmeyer, J., & Grove, N. (2015, March). *Form vs. function: A comparison of Lewis structure drawing tools and the cognitive load they induce.* [Poster presentation]. American Chemical Society Annual Conference, Denver, CO, United States.

B. PRACTITIONER PRESENTATIONS/WORKSHOPS

(1) **Harper-Gampp, T.***, Pearce, M.* (2024, November). *From Stars to Farms: Transforming Science Classes with Virtual Reality.* [Workshop]. North Carolina Science Teacher Association, Winston-Salem, NC, United States.

(2) **Harper-Gampp, T.***, Delgado, C., Peterson, M., Chen, K. B.*, Mathenge, R.*, & Kulasingam, R.* (2024, October). *VR-supported science instruction: Studying scale cognition.* [Roundtable presentation]. North Carolina Department of Public Instruction: Accelerate, Invigorate, and Motivate, Raleigh, NC, United States.

(3) Mathenge, R.*, Alharbi, K.*, **Harper-Gampp, T.**, Delgado, C., Peterson, M., & Chen, K. B. (2023, November). *SCALE-VR: Scale cognition through advanced virtual reality learning environment*. [Professional development]. North Carolina Science Teacher Association, Winston-Salem, NC, United States.

(4) **Harper-Gampp, T.** & Delgado, C. (2023). *Presenting at international conferences.* [Outreach]. EMS 732: Theoretical and critical perspectives in science education. North Carolina State University, Raleigh, NC, United States.

(5) **Gampp, T.** & Wilson, H. (2020). *Playlist for a personalized, student-centered classroom*. [Professional development]. Austin Independent School District: EDU Personalization Conference. Austin, TX, United States.

(6) **Gampp, T.** & Wilson, H. (2020). *Playlist for a student-centered classroom*. [Professional development]. Austin Independent School District: BLEND Summit. Austin, TX, United States.

(7) **Gampp, T.** (2020). *Differentiated conferences*. [Professional development]. Liberal Arts and Sciences Academy Campus Professional Development. Austin, TX, United States.

(8) **Gampp, T.***, Kubasko, D.*, Sewell, E.*, Sharp, A.*, & Taylor, A.* (2017, October). *Island ecology for educators: Using coastal resources to engage students.* [Workshop]. North Carolina Science Teachers Association Conference, Greensboro, NC, United States.

TEACHING RECORD

A. WESTERN GOVERNORS UNIVERSITY

Data-Informed Practices (D179), **Instructor** (Masters Level) Fall 2024 - Present
Educational Research (D180), **Instructor** (Masters Level) Fall 2024 - Present
M.S. in Curriculum and Instruction Capstone (D181), **Instructor** (Masters Level) Fall 2024 - Present

B. NORTH CAROLINA STATE UNIVERSITY

Intro to Research in Science Education (EMS 531), **Teaching Assistant** (Masters Level) Spring 2024
Advanced Methods in Science Education II (EMS 522), **Teaching Assistant** (Masters Level) Fall 2023

C. SECONDARY TEACHING EXPERIENCE

Physics & Physical Science, *ElevateK12* 2023 - 2024
PreAP Chemistry & Planet Earth (i.e., Earth Science), *Liberal Arts and Sciences Academy* 2019 - 2021
Honors Chemistry, AP Physics I, & Physical Science, *Eugene Ashley High School* 2018 - 2019

RECOGNITION

Graduate Research Symposium Winner, *2nd in Education,* North Carolina State University 2024

Distinguished Engagement Award, UNC Wilmington Department of Student Affairs 2016

Resident Hall of Fame, UNC Wilmington Housing and Residence Life 2016

Organization of the Year (National Residence Hall Honorary), UNC Wilmington 2016

Distinguished Research Scholar, UNC Wilmington 2015

PROFESSIONAL SERVICE

National Service:

Member:

- *Social Media, Website, and Communications Committee* (NARST) 2024 - Present

Journal Reviewer:

- *Review of Educational Research (1 review)*

Conference Involvement:

Peer Reviewer:

- *International Conference of the Learning Sciences* (14 reviews) 2022 - Present

- *National Association for Research in Science Teaching* (7 reviews) 2022 - Present

Volunteer Support:

- *North Carolina Science Teachers Association (Exhibitor)* 2024
- *NC State University STEM Ed Graduate Research Symposium (Presider)* 2024
- *NC State University STEM Ed Graduate Research Symposium (Master of Ceremony)* 2023
- *North Carolina Science Teachers Association (Exhibitor)* 2022

PROFESSIONAL MEMBERSHIPS

American Educational Research Association
International Society of the Learning Sciences
National Association for Research in Science Teaching
Association for Science Teacher Education
North Carolina Science Teachers Association