

Jonathon A. Grooms

Curriculum Vitae

Education

Doctor of Philosophy, The Florida State University, Tallahassee, FL (2011)

Major: Science Education

Dissertation: Using Argument-Driven Inquiry to Enhance Students' Argument

Sophistication when Supporting a Stance in the Context of Socioscientific Issues

Dissertation supervisors: Victor Sampson (chair), Sherry Southerland, Allan Jeong, and Simon Capstick

Bachelor of Science, The Florida State University, Tallahassee, FL (2004)

Major: Secondary Science and Math Teaching

Concentration: Chemistry & Physics

Research Focus

My research interests center on the use of innovative instructional models and their role in promoting students' scientific proficiency and teachers' conceptions of disciplinary practices of science and how their conceptions influence classroom instructional decisions. Additionally, I study students' application of scientific habits-of-mind associated with scientific argumentation and disciplinary science practices to other contexts, specifically complex socioscientific issues.

Professional Experience

Assistant Professor of Curriculum & Pedagogy (August 2015 – Present)

Co-Director, GWTeach Undergraduate Teacher Education Program (August 2016 – Present)

The George Washington University, Graduate School of Education and Human Development, Washington, DC

Responsibilities include directing the undergraduate STEM teacher preparation program, GWTeach; teaching graduate level courses in the Department of Curriculum and Pedagogy, and teaching undergraduate courses in the GWTeach program; advising graduate students; conducting rigorous education research; and providing service to the GWU community.

Senior Research Scientist, (July 2013 – August 2015)

Center for Education Research in Mathematics, Engineering, and Science (CERMES), Florida State University, College of Education, Tallahassee, FL

Directed grant proposal development for basic and applied research projects related to the teaching and learning of mathematics, engineering, and science at the K-16 level. Provided leadership by collaborating with and fostering collaboration among faculty members across the Colleges of Education, Arts & Sciences, and Engineering on the design and execution of research projects related to K-16 mathematics, engineering, and science education.

Coordinator of Research Activities (August 2010 – July 2014)

Argument-Driven Inquiry (ADI) in the Middle and High School Laboratory Project, Florida State University, Learning Systems Institute, Tallahassee, FL.

Coordinated data collection and analysis for the Institute of Education Sciences grant. Supervised teacher instruction for fidelity of implementation of the ADI model and assist in developing classroom activities. Facilitated group discussions, with research team, related to project status and challenges. Contributed to the publication and presentation of study results in peer-reviewed journals and national conferences. Managed graduate and undergraduate research assistants on data-related tasks.

K-12 Science Instructor, Director – Science on the Move (August 2004 – August 2010)

Office of Science Teaching Activities (OSTA), Tallahassee, FL

Taught physical science lessons for students within the Leon County School district and eight other surrounding districts. Instruction spanned the K-12 continuum, including lessons in 753 elementary classrooms (~125/year), 197 middle school classrooms (~33/year), and 94 high school classrooms (~16/year), totaling over 40,000 students. These learning opportunities emphasized engaging students in ambitious learning environments that coordinated the essential practices and core ideas of science in student-centered contexts.

Undergraduate Teaching Assistant (January 2008 – April 2008)

Florida State University, Dept. of Physics, Tallahassee, FL

Developed curriculum materials and laboratory activities for an introductory studio physics course, during its first semester of implementation, which was modeled on the SCALE-UP approach. Assessed subsequent lab reports and assisted with classroom instruction.

Professional Affiliations

American Educational Research Association (AERA)

National Association for Research in Science Teaching (NARST)

National Science Teachers Association (NSTA)

Maryland Association of Science Teachers (MAST)

Virginia Association of Science Teachers (VAST)

Teaching Experience: The George Washington University

GTCH 3101 Knowing and Learning in Mathematics and Science (Undergraduate)

CPED 6100 STEM Curriculum Implementation (Graduate Course)

CPED 6534 Professional Internship in Secondary Education (Graduate Course)

CPED 6606 Theories of Learning and Development (Graduate Course)

CPED 6608 Development and Diversity in Education (Graduate Course)

CPED 6703 Advanced STEM Teaching Methods (Graduate Course)

CPED 8331 Seminar in Instruction (Doctoral Course)

Doctoral Student Committees: George Washington University

Nash, Fredrica (anticipated graduate, Spring 2021)
Goldman, Zachary (anticipated graduation, Spring 2021)
Ford, Michael (dissertation examination committee, Spring 2017)

Masters Student Advisees: George Washington University

Gargulak, Morgan (2019)
Ellis, Breanna (2018)
Salzman, Jessica (2017)

Apprentice Teacher Supervision: George Washington University

D'Angelo, Lisa (Spring, 2016)
Dutton, Jason (Spring, 2016)
Kim, Ji Young (Spring, 2016)
Nogay, Walter (Spring, 2016)

Teaching Experience: Florida State University

SMT 3100 Knowing and Learning in Mathematics and Science (Undergraduate Course)
BSC 5935 Selected Topics in Biological Science: Assessment in Math and Science Education (Doctoral Course)
SCE 5140 Curriculum in Science Education (Doctoral Course)
SCE 6761 Research, Recent Developments, and Current Issues in Science Education: Scientific Argumentation (Doctoral Course)
PHY 2048C General Physics A, Studio-Physics: Integrated Lecture/Lab (Teaching Assistant, Undergraduate Course)

Apprentice Teacher Supervision: Florida State University

Green, Michael (Spring, 2013)
Ciaccio, Heather (Spring, 2009)

Refereed Journal Articles

17. **Grooms, J.**, Sampson, V., and Enderle, P. (2018). How concept familiarity and experience with scientific argumentation are related to the way groups participate in an episode of argumentation. *Journal of Research in Science Teaching*, 55(9), 1264-1286.
16. Strimaitis, A., Southerland, S., Sampson, V., Enderle, P., and **Grooms, J.** (2017). Promoting equitable biology lab instruction by engaging all students in a broad range of science practices: An exploratory study. *School Science and Mathematics*, 117(3), 92-103.

15. **Grooms, J.**, Enderle, P., and Sampson, V. (2015). Coordinating scientific argumentation and the Next Generation Science Standards through argument-driven inquiry. *Science Educator*, 24(1), 45-50.
14. **Grooms, J.**, Sampson, V., and Golden, B. (2014). Comparing the effectiveness of verification and inquiry laboratories in supporting undergraduate science students in constructing arguments around socioscientific issues. *International Journal of Science Education*, 36(9), 1412-1433.
13. Strimaitis, A., Schellinger, J., Jones, A., Beaver, S., **Grooms, J.**, and Sampson, V. (2014). Development of an instrument to assess student knowledge necessary to critically evaluate scientific claims in the popular media. *Journal of College Science Teaching*, 43(5), 55-68.
12. Enderle, P., **Grooms, J.**, Campbell, H., and Bickel, R. (2013). Cross-disciplinary writing: Scientific argumentation, the common core, and the ADI model. *Science Scope*, 37(1), 16-22.
11. Sampson, V., Enderle, P., **Grooms, J.**, and Witte, S. (2013). Writing to learn by learning to write during the school science laboratory: Helping middle and high school students develop argumentative writing skills as they learn core ideas. *Science Education*, 97(5), 643-670.
10. Sampson, V., **Grooms, J.**, and Enderle, P. (2013). Argumentation in science and science education: Helping students understand the nature of scientific argumentation so they can meet the new science standards. *The Science Teacher*, 80(5), 30-33.
9. Enderle, P., Southerland, S., and **Grooms, J.** (2013). Exploring the context of change: Understanding the kinetics of a studio physics implementation effort. *Physical Review Special Topics – Physics Education Research*, 9, 1-18.
8. Sampson, V., Enderle, P., and **Grooms, J.** (2013). The development and initial validation of the Beliefs About Reformed Science Teaching and Learning (BARSTL) questionnaire. *School Science and Mathematics*, 113(1), 3-15.
7. Golden, B., **Grooms, J.**, Sampson, V., and Oliveri, R. (2012). Generating arguments about climate change. *Science Scope*, 35(7), 26-34.
6. Walker, J., Sampson, V., **Grooms, J.**, Zimmerman, C., and Anderson, B. (2012). Argument-Driven Inquiry in undergraduate chemistry labs: The impact on students' conceptual understanding, argument skills, and attitudes toward science. *Journal of College Science Teaching*, 41(4), 82-89.
5. Walker, J., Sampson, V., Zimmerman, C., and **Grooms, J.** (2011). A performance-based assessment for limiting reactants. *Journal of Chemical Education*, 88(9), 1243-1246.

4. Sampson, V., **Grooms, J.**, and Walker, J. (2011). Argument-Driven Inquiry as a way to help students learn how to participate in scientific argumentation and craft written arguments: An exploratory study. *Science Education*, 95(2), 217-257.
3. Sampson, V. and **Grooms, J.** (2010). Promoting and supporting scientific argumentation in the classroom: The generate an argument instructional model. *The Science Teacher*, 77(5), 32-37.
2. Sampson, V., **Grooms, J.**, and Walker, J. (2009). Argument-Driven Inquiry: A way to promote learning during laboratory activities. *The Science Teacher*, 76(8), 42-47.
1. Sampson, V. and **Grooms, J.** (2009). Promoting and supporting scientific argumentation in the classroom: The evaluate alternatives instructional model. *Science Scope*, 33(1), 67-73.

Journal Articles in Review or Preparation

1. Enderle, P., **Grooms, J.**, Sampson, V., Sengul, O., and Koulagna, Y. (in preparation). How implementing and refining an argumentation instructional model can shape science teacher beliefs. Submitted to *Science Education*.
2. **Grooms, J.**, Sampson, V., Enderle, P., Gooden, S., and Shellinger, J. (in preparation). The influence of teacher framing and instructional actions on students' scientific argumentation. To be submitted to *Journal of Research in Science Teaching*.
3. **Grooms, J.** and Fleming, K. (in preparation). Students' epistemological sophistication and conceptions of data and evidence. To be submitted to *Journal of College Science Teaching*.
4. **Grooms, J.**, Fleming, K., and Wolfinger, M. (in preparation). Student and teacher tensions and synergies during whole-district curriculum development and implementation. To be submitted to *Science Education*.

Refereed Books

9. Sampson, V., Hutner, T., FitzPatrick, D., LaMee, A., and **Grooms, J.** (2017). *Argument-Driven Inquiry in Physics, Volume 1: Mechanics Lab Investigations for Grades 9-12*. Arlington, VA: NSTA Press.
8. **Grooms, J.**, Enderle, P., Murphy, A., Hutner, T., and Sampson, V. (2016). *Argument-Driven Inquiry in Physical Science: Lab Investigations for Grades 6-8*. Arlington, VA: NSTA Press.
7. **Grooms, J.**, Enderle, P., Murphy, A., Hutner, T., and Sampson, V. (2016). *Student Lab Manual for Argument-Driven Inquiry in Physical Science: Lab Investigations for Grades 6-8*. Arlington, VA: NSTA Press.

6. Enderle, P., Campbell, H., Gleim, L., Granger, E., **Grooms, J.**, Hester, M., Sampson, V., and Southerland, S. (2016). Student Lab Manual for Argument-Driven Inquiry in Life Science: Lab Investigations for Grades 6-8. Arlington, VA: NSTA Press.
5. Sampson, V., Carafano, P., Enderle, P., Fannin, S., **Grooms, J.**, Southerland, S., Stallworth, C., and Williams, K. (2016). Student Lab Manual for Argument-Driven Inquiry in Chemistry: Lab Investigations for Grades 9-12. Arlington, VA: NSTA Press
4. Sampson, V., Enderle, P., Gleim, L., **Grooms, J.**, Hester, M., Southerland, S., and Wilson, K. (2016). Student Lab Manual for Argument-Driven Inquiry in Biology: Lab Investigations for Grades 9-12. Arlington, VA: NSTA Press.
3. Enderle, P., Campbell, H., Gleim, L., Granger, E., **Grooms, J.**, Hester, M., Sampson, V., and Southerland, S. (2015). Argument-Driven Inquiry in Life Science: Lab Investigations for Grades 6-8. Arlington, VA: NSTA Press.
2. Sampson, V., Carafano, P., Enderle, P., Fannin, S., **Grooms, J.**, Southerland, S., Stallworth, C., and Williams, K. (2014). Argument-Driven Inquiry in Chemistry: Lab investigations for grades 9-12. Arlington, VA: NSTA Press.
1. Sampson, V., Enderle, P., Gleim, L., **Grooms, J.**, Hester, M., Southerland, S., and Wilson, K. (2014). Argument-Driven Inquiry in Biology: Lab investigations for grades 9-12. Arlington, VA: NSTA Press.

Refereed Papers Presented at National or International Conferences

29. **Grooms, J.**, Fleming, K., Wolfinger, M., Berkowitz, A., and Caplan, B. (2019, April). What teacher-student tensions and synergies emerge from implementing an integrated chemistry/Earth science curriculum? Paper presented at the 2019 Annual Meeting of the American Educational Research Association (AERA). Toronto, ON, Canada.
28. **Grooms, J.** (2018, April). How does content knowledge predict ability to engage in scientific argumentation? Paper at the 2018 Annual Meeting of the American Educational Research Association (AERA). New York, NY.
27. Enderle, P., Sengul, O., Koulagna, Y., **Grooms, J.**, and Sampson, V. (2017, April). The impact of implementing and refining an argumentation instructional model on science teacher' beliefs. Paper presented at the 2017 international conference of the National Association for Research in Science Teaching (NARST). San Antonio, TX.
26. Enderle, P., Strimaitis, A., **Grooms, J.**, Sampson, V., and Southerland, S. (2016, April). Comparing laboratory instruction for differently tracked groups of students. Paper presented at the 2016 international conference of the National Association for Research in Science Teaching (NARST). Baltimore, MD.
25. Strimaitis, A., Enderle, P., **Grooms, J.**, Sampson, V., and Bremer, M. (2015, April). How teachers promote scientific argumentation between students during school science

laboratories. Paper presented at the 2015 Annual Meeting of the American Educational Research Association (AERA). Chicago, IL.

24. Gooden, S., Schellinger, J., **Grooms, J.**, Enderle, P., and Sampson, V. (2015, April). The impact of teacher framing and instructional action on student growth in scientific argumentation. Paper presented at the 2015 Annual Meeting of the American Educational Research Association (AERA). Chicago, IL.
23. Strimaitis, A., Southerland, S., **Grooms, J.**, Enderle, P., and Sampson, V. (2015, April). Structuring chemistry laboratories around argumentation: Examining the effectiveness of argumentation in fostering science for all. Paper presented at the 2015 Annual Meeting of the American Educational Research Association (AERA). Chicago, IL.
22. Schellinger, J., Gooden, S., **Grooms, J.**, Bremer, M., Sampson, V., and Enderle, P. (2015, April). The influence of one teacher's framing and instructional actions on students' scientific argumentation. Paper presented at the 2015 international conference of the National Association for Research in Science Teaching (NARST). Chicago, IL.
21. Strimaitis, A., Enderle, P., **Grooms, J.**, and Sampson, V. (2015, April). Validation of new biology instruments that assess three aspects of science proficiency. Paper presented at the 2015 international conference of the National Association for Research in Science Teaching (NARST). Chicago, IL.
20. Strimaitis, A., Southerland, S., **Grooms, J.**, Enderle, P., and Sampson, V. (2015, April). The potential of ambitious instruction for fostering science for all: A comparative case study. Paper presented at the 2015 international conference of the National Association for Research in Science Teaching (NARST). Chicago, IL.
19. **Grooms, J.**, Enderle, P., and Sampson, V. (2014, April). How content knowledge and past experience can influence an episode of argumentation. Paper presented within the related paper set: Exploring contexts and content influence on teaching and learning argumentation, at the 2014 international conference of the National Association for Research in Science Teaching (NARST). Pittsburgh, PA.
18. Strimaitis, A., Enderle, P., **Grooms, J.**, and Sampson, V. (2014, April). Validation of new chemistry instruments that assess three aspects of science proficiency. Paper presented at the 2014 international conference of the National Association for Research in Science Teaching (NARST). Pittsburgh, PA.
17. Southerland, S., Strimaitis, A., Enderle, P., **Grooms, J.**, and Sampson, V. (2014, April). The effectiveness of argumentation in fostering science for all: Examining the effects of challenging instruction in biology laboratories. Paper presented at the 2014 Annual Meeting of the American Educational Research Association (AERA). Philadelphia, PA.
16. Enderle, P., **Grooms, J.**, and Sampson, V. (2013, September). Using argumentation in science education to promote the development of science proficiency: A comparative case

study. Paper presented in the symposium: Engaging students in argumentation and sense-making activities to improve science learning, at the 2013 Fall Conference of The Society for Research on Educational Effectiveness (SREE). Washington, D.C.

15. **Grooms, J.**, Enderle, P., Sampson, V. (2013, April). A comparative study of the development of science proficiency in high school chemistry. Paper presented at the 2013 international conference of the National Association for Research in Science Teaching (NARST). Rio Grande, Puerto Rico.
14. Southerland, S., Enderle, P., **Grooms, J.**, and Sampson, V. (2013, March). Teacher beliefs and the implementation of curriculum focusing on multiple science proficiencies. Paper presented at the 2013 international conference of the National Association for Research in Science Teaching (NARST). Rio Grande, Puerto Rico.
13. **Grooms, J.** (2012, April). Exploring the potential reflexive nature of epistemological development and argument generation abilities for undergraduate students. Paper presented at the 2012 Annual Meeting of the American Educational Research Association (AERA). Vancouver, BC.
12. **Grooms, J.**, Sampson, V., and Carafano, P. (2012, April). The impact of a new instructional model on high school science writing. Paper presented at the 2012 Annual Meeting of the American Educational Research Association (AERA). Vancouver, BC.
11. Enderle, P., **Grooms, J.**, and Williams, K. (2012, April). The development of science proficiency in high school chemistry students engaged in argument focused instruction. Paper presented at the 2012 Annual Meeting of the American Educational Research Association (AERA). Vancouver, BC.
10. Sampson, V., Enderle, P., Hester, M., and **Grooms, J.** (2012, April). The development of science proficiency through argument focused lab instruction in high school biology. Paper presented at the 2012 Annual Meeting of the American Educational Research Association (AERA). Vancouver, BC.
9. **Grooms, J.** and Sampson, V. (2012, March). Using a science laboratory course to enhance undergraduate students' arguments related to socioscientific issues. Paper presented at the 2012 international conference of the National Association for Research in Science Teaching (NARST). Indianapolis, IN.
8. Enderle, P., **Grooms, J.**, and Sampson, V. (2012, March). Argument focused instruction and science proficiency in middle and high school. Paper presented in the symposium: Argument focused instruction and science proficiency, at the 2012 international conference of the National Association for Research in Science Teaching (NARST). Indianapolis, IN.
7. Sampson, V., **Grooms, J.**, Enderle, P., and Southerland, S. (2012, March). Using laboratory activities that emphasize argumentation and argument to help high school students learn how to engage in scientific inquiry and understand the nature of scientific

inquiry. Paper presented at the 2012 international conference of the National Association for Research in Science Teaching (NARST). Indianapolis, IN.

6. Enderle, P., **Grooms, J.**, and Sampson, V. (2012, January). The importance of using multiple measures to assess science proficiency. Paper presented at the 2012 Annual Conference of the Association of Science Teacher Educators (ASTE). Clearwater, FL.
5. Sampson, V., **Grooms, J.**, and Enderle, P. (2011, September). New instruments that can be used by researchers to assess three different aspects of science proficiency. Paper presented at the 2011 Fall Conference of the Society for Research on Educational Effectiveness (SREE). Washington, DC.
4. Walker, J., **Grooms, J.**, Anderson, B., Zimmerman, C., and Sampson, V. (2010, March). Argument-Driven Inquiry: An instructional model for use in undergraduate chemistry labs. Paper presented at the 2010 international conference of the National Association for Research in Science Teaching (NARST). Philadelphia, PA.
3. **Grooms, J.**, Sampson, V., and Gross, L. (2009, April). What makes a scientific argument persuasive? How middle and high school students view different types of arguments. Paper presented at the 2009 international conference of the National Association for Research in Science Teaching (NARST). Garden Grove, CA.
2. Sampson, V. and **Grooms, J.** (2008, April). Science as Argument-Driven Inquiry: The impact on student's conceptions of nature of science. Paper presented at the 2008 international conference of the National Association for Research in Science Teaching (NARST). Baltimore, MD.
1. **Grooms, J.** (2006, September). Science and Science Education: Why the disconnect? Paper presented at the 2006 Science Education at the Crossroads Conference. Ogden, UT.

Refereed Presentations at National or International Conferences

6. Sampson, V., **Grooms, J.**, and Hutner, T. (2017, March). NSTA Press Session: Argument-Driven Inquiry in Biology, Chemistry, and Physics: Lab Investigations for Grades 9-12. Presentation given at the National Conference of the National Science Teachers Association, Los Angeles, CA.
5. Sampson, V., **Grooms, J.**, and Hutner, T. (2017, March). NSTA Press Session: Argument-Driven Inquiry in Life Science and Physical Science: Lab Investigations for Grades 6-8. Presentation given at the National Conference of the National Science Teachers Association, Los Angeles, CA.
4. **Grooms, J.** and Sampson, V. (2015, March). Coordinating scientific argumentation, the Next Generation Science Standards, and the Common Core State Standards through the Argument-Driven Inquiry instructional model. Presentation given at the 2015 Professional Development Institute of the National Science Education Leadership Association.

3. Sampson, V., **Grooms, J.**, and Enderle, P. (2013, April). NARST Session: Argument-Driven Inquiry as a way to help middle and high school students develop science proficiency during labs. Presentation given at the 2013 National Conference of the National Science Teachers Association (NSTA). San Antonio, TX.
2. Sampson, V., Wicker, L., Hester, M., Carafano, P., Enderle, P., and **Grooms, J.** (2012, April). The benefits and challenges of a large-scale implementation of a new instructional model for science laboratories. Presentation given at the 2012 International Conference of the International Association of Laboratory Schools (IALS). Tallahassee, FL.
1. Kostka, B., Golden, B., and **Grooms, J.** (2011, March) NARST Session: Argument-Driven Inquiry: Investigating Climate Change and Evolution across Deep Time. Presentation given at the 2011 National Conference of the National Science Teachers Association. San Francisco, CA

Refereed Presentations at Regional or State Conferences

18. **Grooms, J.** and Sampson, V. (2018, November). NSTA Press Session: Argument-Driven Inquiry in Biology, Chemistry, and Physics: Lab Investigations for Grades 9-12. Presentation given at the Regional Conference of the National Science Teachers Association, National Harbor, MD.
17. Sampson, V., and **Grooms, J.** (2018, November). NSTA Press Session: Argument-Driven Inquiry in the Life, Physical, and Earth/Space Sciences: Lab Investigations for Grades 6-8. Presentation given at the Regional Conference of the National Science Teachers Association, National Harbor, MD.
16. Sampson, V., and **Grooms, J.** (2018, November). NSTA Press Session: Argument-Driven Inquiry in Grades 3-5. Presentation given at the Regional Conference of the National Science Teachers Association, National Harbor, MD.
15. **Grooms, J.** (2017, November). Using Argument-Driven Inquiry to Transform Science Labs. Presentation given at the annual Virginia Association of Science Teachers Professional Development Institute, Roanoke, VA.
14. **Grooms, J.** and Sampson, V. (2017, October). NSTA Press Session: Argument-Driven Inquiry in Biology: Lab Investigations for Grades 9-12. Presentation given at the Regional Conference of the National Science Teachers Association, Baltimore, MD.
13. **Grooms, J.** and Sampson, V. (2017, October). NSTA Press Session: Argument-Driven Inquiry in Physics: Lab Investigations for Grades 9-12. Presentation given at the Regional Conference of the National Science Teachers Association, Baltimore, MD.
12. **Grooms, J.** and Sampson, V. (2017, October). NSTA Press Session: Argument-Driven Inquiry in Physical Science: Lab Investigations for Grades 6-8. Presentation given at the Regional Conference of the National Science Teachers Association, Baltimore, MD.

11. **Grooms, J.** (2016, November). Using Argument-Driven Inquiry as a way to Transform Labs and Develop Science Proficiency. Presentation given at the annual Virginia Association of Science Teachers Professional Development Institute, Williamsburg, VA.
10. **Grooms, J.** (2016, October). 3-D Teaching Through Argument-Driven Inquiry. Presentation given at the annual Maryland Association of Science Teachers STEM Conference, Laurel, MD.
9. **Grooms, J.** (2016, February). Using Argument-Driven Inquiry to engage students in essential practices of science and engineering. Presentation given at the District of Columbia, Office of the State Superintendent of Education, It Takes a City: Achieving Higher Standards LEA Institute, Washington, D.C.
8. **Grooms, J.** and Strimaitis, A. (2015, April). Validation of new biology instruments that assess three aspects of science proficiency. Presentation given at the Marvalene Hughes Research in Education Symposium held at Florida State University. Tallahassee, FL.
7. Southerland, S., Walker, J., **Grooms, J.**, Enderle, P., and Sampson, V. (2015, April). Laboratory as community: Equity and efficacy with reformed instructional practices. Presentation given at the Marvalene Hughes Research in Education Symposium held at Florida State University. Tallahassee, FL.
6. Strimaitis, A., Southerland, S., **Grooms, J.**, Enderle, P., and Sampson, V. (2015, April). The potential of ambitious instruction for fostering science for all: An exploratory comparative case study of high school chemistry laboratory instruction. Presentation given at the Marvalene Hughes Research in Education Symposium held at Florida State University. Tallahassee, FL.
5. **Grooms, J.** (2015, February). Using argument-driven inquiry to support students' science proficiency. Presentation given at the 2015 annual meeting of the Georgia Science Teachers Association.
4. **Grooms, J.** (2014, April). How content knowledge and past experiences can influence an episode of argumentation. Presentation given at the Marvalene Hughes Research in Education Symposium held at Florida State University. Tallahassee, FL.
3. **Grooms, J.**, Enderle, P., Sampson, V. (2013, March). The impact of ADI on science proficiency for high school chemistry. Presentation given at the Marvalene Hughes Research in Education Symposium held at Florida State University. Tallahassee, FL.
2. **Grooms, J.**, Enderle, P., and Sampson, V. (2012, December). Argumentation and Argument-Driven Inquiry in middle school. Presentation given at the Florida Center for Research in Science, Technology, Engineering, and Mathematics (FCR-STEM) Conference. St. Petersburg, FL.
1. Enderle, P., **Grooms, J.**, and Sampson, V. (2012, December). Argumentation and Argument-Driven Inquiry in high school. Presentation given at the Florida Center for

Research in Science, Technology, Engineering, and Mathematics (FCR-STEM)
Conference. St. Petersburg, FL.

Invited Presentations

22. **Grooms, J.** (2019, April). Developing Conceptual Frameworks and Effective Research Questions. Presentation at the 2019 George Washington University Graduate School of Education and Human Development Dissertation Bootcamp, Washington, DC.
21. **Grooms, J.** (2019, April). Transitioning from Graduate School to Faculty. Presentation as part of the Graduate School of Education and Human Development Graduate Research Assistant Forum, Washington, DC.
20. **Grooms, J.** (2018, February). Engaging Students in Science Practices through Argument-Driven Inquiry. Presentation provided during the District of Columbia Public Schools Science Professional Development Day, Washington, DC.
19. **Grooms, J.** (2017, September). Using Argument-Driven Inquiry in Middle and High School Science to Support Student Learning. Webinar presented for science education methods students at the University of Minnesota – Morris. Web-based from Washington, DC.
18. **Grooms, J.** (2017, August). Generate an Argument: An Instructional Model. Webinar provided for STEM Central in combination with National Science Foundation funded project, Effects of Socioscientific Argumentation Development on Student Academic Success, Washington, DC.
17. **Grooms, J.** (2016, November). Scientific Argumentation in the Classroom: Using ADI to Transform Lab Experiences. Presentation given at Bethune-Cookman University for STEM faculty and students in support of the National Science Foundation funded project, Effects of Socioscientific Argumentation Development on Student Academic Success, Daytona Beach, FL.
16. **Grooms, J.** (2016, November). Engaging Students in the Practices of Science to Foster Science Proficiency. Presentation given at the University of Maryland Department of Educational Psychology fall colloquium series, College Park, MD.
15. **Grooms, J.** (2016, October). Argument-Driven Inquiry in Middle and High School Science. Webinar presented for science education methods students at the University of Minnesota – Morris. Web-based from Washington, DC.
14. **Grooms, J.** (2016, July). Science Education in the United States – STEM Teaching. Presentation given for the visiting delegation from Second Yuying Foreign Languages School of Nanjing, China, Vienna, VA.

13. **Grooms, J.** (2016, January). Science education in the United States: A short course. Presentation and workshop for the Department of Education – Changping District, Beijing, China conducted in Alexandria, VA.
12. **Grooms, J.** (2015, November). NSTA Press Session: Argument-Driven Inquiry in Biology and Chemistry: Lab Investigations for Grades 9-12. Presentation given at the 2015 National Science Teachers Association Philadelphia Area Conference, Philadelphia, PA.
11. **Grooms, J.** (2015, October). Argument-Driven Inquiry in Middle and High School Science. Webinar presented for science education methods students at the University of Minnesota – Morris. Web-based from Washington, DC.
10. **Grooms, J.,** Sampson, V., Enderle, P., and Hester, M. (2015, March). NSTA Press Session: Argument-Driven Inquiry in Biology: Lab Investigations for Grades 9-12. Presentation given at the 2015 National Conference of the National Science Teachers Association, Chicago, IL.
9. **Grooms, J.** (2014, May). Enhancing students' science proficiency through Argument-Driven Inquiry. Presentation given as invited speaker for the 2014 Florida Annual Meeting and Expo of the American Chemical Society – Chemical Education Symposium. Palm Harbor, FL.
8. **Grooms, J.** (2014, April). Randomized Control Trials in Education Research. Presentation given as part of the spring speaker series for the Center for Education Research in Mathematics, Engineering, and Science. Tallahassee, FL.
7. **Grooms, J.** and Enderle, P. (2013, November). Argument-Driven Inquiry at Florida State University Schools: A review of three years of research. Presentation given to the Florida State University Schools (FSUS) Board of Directors. Tallahassee, FL.
6. Sampson, V., **Grooms, J.**, and Enderle, P. (2012, November). NARST Session: Argument-Driven Inquiry as a way to help students learn how to engage in scientific inquiry and understand the nature of scientific inquiry. Presentation given on behalf of the National Association for Research in Science Teaching (NARST) at the 2012 Southern Region Conference of the National Science Teachers Association (NSTA). Atlanta, GA.
5. Sampson, V., Enderle, P., Hester, M., and **Grooms, J.** (2012, March). The development of science proficiency through argument focused lab instruction in high school biology. Presentation given at the Marvalene Hughes Research in Education Symposium held at Florida State University. Tallahassee, FL.
4. **Grooms, J.**, Enderle, P., and Sampson, V. (2011, December). Argumentation and Argument-Driven Inquiry in middle school. Presentation given at the Second Florida Center for Research in Science, Technology, Engineering, and Mathematics (FCR-STEM) Conference. Destin, FL.

3. Enderle, P., **Grooms, J.**, and Sampson, V. (2011, December). Argumentation and Argument-Driven Inquiry in high school. Presentation given at the Second Florida Center for Research in Science, Technology, Engineering, and Mathematics (FCR-STEM) Conference. Destin, FL.
2. **Grooms, J.** and Enderle, P. (2012, November). *Arguing from evidence: The importance of argumentation in the science classroom*. Webinar presented for teacher participants of the BIOSCOPES project throughout the state of Florida. Tallahassee, FL.
1. Sampson, V. and **Grooms, J.** (2012, March). *Assessment that can promote and support student learning in biology*. Lecture given for Leon County School District. Tallahassee, FL.

Invited Workshops and Professional Development

30. **Grooms, J.** (2019, January). Argument-Driven Inquiry for Middle School Life Science. Workshop for middle school science teachers, provided for Grand Prairie Independent School District, Grand Prairie, TX.
29. **Grooms, J.** (2018, August). Introduction to Argument-Driven Inquiry for High School Physical Sciences. Workshop for high school science teachers, provided for McAllen Independent School District, McAllen, TX.
28. **Grooms, J.** (2018, August). Introduction to Argument-Driven Inquiry for Elementary School Science. Workshop for elementary science teachers, provided for Clayton County Schools, Jacksonboro, GA.
27. Sampson, V., **Grooms, J.**, and Hutner, T. (2017, March). *Transforming Laboratory Experience so Students Can Use Core Ideas, Crosscutting Concepts, and Science Practices to Make Sense of Natural Phenomena*. Workshop provided as part of the National Science Teachers Association Professional Learning Institute. Los Angeles, CA.
26. **Grooms, J.** (2017, March). *Micro-teaching for Argument-Driven Inquiry*. One-day workshop for middle and high school science teachers, provided for Clayton County Schools. Jacksonboro, GA.
25. **Grooms, J.** (2017, January). *Micro-teaching for Argument-Driven Inquiry*. One-day workshop for middle and high school science teachers, provided for Clayton County Schools. Jacksonboro, GA.
24. **Grooms, J.** (2016, November). *Argument-Driven Inquiry in Middle and High School Science*. Two-day workshop for middle and high school science teachers, provided for Osceola County Schools, Melbourne, FL.
23. **Grooms, J.** (2016, October). *Argument-Driven Inquiry in Science*. One-day workshop for middle and high school science teachers, provided for Alexandria City Public Schools, Alexandria, VA.

22. **Grooms, J.** (2016, August). *Argument-Driven Inquiry in Science*. Two-day workshop for middle and high school science teachers, provided for Alexandria City Public Schools, Alexandria, VA.
21. **Grooms, J.** (2016, August). *Argument-Driven Inquiry for Middle School Physical Science*. One-day workshop for middle school physical science teachers, provided for Clayton County Schools. Jacksonboro, GA.
20. **Grooms, J.** (2016, June). *Argument-Driven Inquiry for High School Chemistry*. Four-day workshop for high school science teachers, provided for Clayton County Schools. Jacksonboro, GA.
19. **Grooms, J.** and Sampson, V. (2015, August). *Argument-Driven Inquiry in Life Science*. One-day workshop for middle and high school life science teachers, provided for Coppell Independent School District. Coppell, TX.
18. **Grooms, J.** and Hubenthal, M. (2015, August). *Michigan Earth Science Institute: Teaching Earth Science through Argument-Driven Inquiry*. Three-day workshop for middle and high school Earth science teachers, provided for Oakland Schools. Detroit, MI.
17. **Grooms, J.** and Sampson, V. (2015, August). *Introduction to Argument-Driven Inquiry for the Life and Physical Sciences*. Two-day workshop for middle and high school science teachers, provided for Amarillo Independent School District. Amarillo, TX.
16. **Grooms, J.** (2015, August). *Teaching Life Science through Argument-Driven Inquiry*. One-day workshop for middle and high school physical science teachers, provided for Bay District Schools. Panama City, FL.
15. **Grooms, J.** (2015, July). *Incorporating Argument-Driven Inquiry into the Middle and High School Science Curriculum*. Three-day workshop for middle and high school science teachers, provide for Hoover County Schools. Birmingham, AL.
14. **Grooms, J.** (2015, July). *Teaching Physical Science through Argument-Driven Inquiry*. One-day workshop for middle and high school physical science teachers, provided for Bay District Schools. Panama City, FL.
13. **Grooms, J.** (2015, June). *Argument-Driven Inquiry for Middle School Life Science*. One-day workshop for middle school life science teachers, provided for Pinellas County Schools. Largo, FL.
12. **Grooms, J.**, Enderle, P., and Sampson, V. (2015, June). *An Introduction to Argumentation in Elementary School Science*. Two-day workshop for middle and high school science teachers, provided for Atlanta Public Schools. Atlanta, GA.
11. **Grooms, J.**, Enderle, P., and Sampson, V. (2015, May). *An Introduction to Argument-Driven Inquiry and Curriculum Planning for Middle and High School Science*. Three-day

workshop for middle and high school science teachers, provided for Atlanta Public Schools. Atlanta, GA.

10. **Grooms, J.** and Enderle, P. (2014, October). *Improving High School Chemistry Instruction Through Argument-Driven Inquiry*. One-day in-service workshop for high school chemistry teachers to experience the ADI instructional model, provided for Marion County School District. Bellevue, FL.
9. **Grooms, J.** and Sampson, V. (2014, July). *Curriculum mapping and Argument-Driven Inquiry and High School Chemistry*. Two-day workshop for high school chemistry teachers to learn about the ADI instructional model and develop investigations appropriate for their curriculum, provided for Leon County School District. Tallahassee, FL.
8. **Grooms, J.**, Sampson, V., and Enderle, P. (2014, July). *Argument-Driven Inquiry and Curriculum Mapping for Middle and High School Physical Science*. Four-day workshop for middle and high school chemistry, physics, physical science, and Earth science teachers to experience the ADI instructional model and develop ADI investigations related to their specific curriculum, provided for Hillsborough County Public Schools. Tampa, FL.
7. **Grooms, J.**, Sampson, V., and Enderle, P. (2013, December). *Argument-Driven Inquiry for the High School Chemistry Classroom*. One-day workshop for teachers to experience the ADI instructional model as it relates to high school chemistry, provided for Polk County School District. Lakeland, FL.
6. **Grooms, J.** and Sampson, V. (2013, November). *Enhancing Elementary Science Instruction using the Science Writing Heuristic (SWH)*. Two-day workshop to introduce the SWH approach to science instruction for grades K-5 and facilitate development of classroom activities for teacher participants in Leon County Schools. Tallahassee, FL.
5. **Grooms, J.** and Enderle, P. (2013, October). *Improving Middle School Science Instruction Through Argument-Driven Inquiry*. One-day in-service workshop for middle school science teachers to experience the ADI instructional model, provided for Marion County School District. Bellevue, FL.
4. **Grooms, J.** (2013, September). *Using Argument-Driven Inquiry to Enhance STEM Education*. One-day workshop to introduce the ADI model to grade 6-12 STEM and CTE educators in Bay County School District. Panama City, FL.
3. Sampson, V., **Grooms, J.**, and Enderle, P. (2013, January). *Introduction to Argument-Driven Inquiry for Middle and High School*. Two-day workshop to introduce the ADI instructional model to middle and high school teachers in Leon County Schools. Tallahassee, FL.
2. Sampson, V., **Grooms, J.**, Southerland, S., and Enderle, P. (2012, May). *Improving the teaching and learning of Biology*. A series of six one-day professional development workshops provided for the Leon County School District. Tallahassee, FL.

1. **Grooms, J. & Lutz, R.** (2007, October). *Curriculum Topic Study (CTS) as a vehicle for curriculum development*. Two-day workshop to introduce Curriculum Topic Study for grades 6-8 faculty and at Cornerstone Learning Community. Tallahassee, FL.

Multi-Year Professional Development

3. Great Explorations in Math and Science (GEMS) (2004 – 2009)
Served as a presenter of various GEMS guides for workshops serving K-8 teachers, as part of the OSTA team, in order to encourage the use of inquiry-based teaching strategies in science classrooms and introduce curriculum materials that support the implementation of inquiry-based instruction.
2. Motion, Forces, and Energy I (2006 – 2008)
Prepared and implemented three two-week physical science workshops for public school teachers for grades 1-5. Tallahassee, FL.
1. Motion, Forces & Energy II (2005 – 2007)
Prepared and implemented four two-week physical science workshops for public school teachers for grades 6-12 in North Florida. Includes workshops in Tallahassee, FL, Panama City, FL, and Gainesville, FL.

Service to the Profession

National Association for Research in Science Teaching (NARST)

- Invited Panelist, Graduate Student Forum, NARST Annual Meeting, 2019
- Invited Panelist, Graduate Student Forum, NARST Annual Meeting, 2018
- Outstanding Paper Award Committee, 2011-2015

National Science Teachers Association (NSTA)

- 2018 Regional Conference, National Harbor, MD – Planning Committee, Program Coordinator
- Book manuscript review

Journal of Research in Science Teaching (JRST)

- Editorial Board, 2018-present
- Manuscript review, 2011-present

Science Education

- Manuscript review, 2016-present

International Journal of Science Education (IJSE)

- Manuscript review, 2013-present

Service to the University

George Washington University

- Co-Director of GWTeach undergraduate STEM teacher preparation program, Interdisciplinary collaboration between the Graduate School of Education and Human Development and the Columbian College of Arts and Science, 2016-present
- GW Academic Leadership Academy, 2019

Graduate School of Education and Human Development

- Graduate Certificate in STEM Teaching, Program Coordinator, 2016-present
- Post-Masters Appeals Committee, Departmental Representative, 2017-present
- GSEHD Accreditation Council, 2018-present
- Invited speaker, Graduate Research Assistant Speaker Series, 2019
- Invited speaker, Graduate Student Dissertation Boot Camp, 2019

George Washington University STEM Academy

- Sub-committee for Collaboration and Projects with GSEHD, 2015-2016

Service to the Community

District of Columbia Office of the State Superintendent of Education

State Science Leadership Team (2016 – 2017)

DC Science Assessment Standard Setting Committee (2017)

DC Science Assessment Content and Bias Review Committee (2016)

DC STEM Network

Professional Development Working Group (2015 – 2017)

Sponsored Projects

- 8/2017 – 6/2020 *ICE: Integrating Chemistry and Earth Science.* This project is a collaboration between the Cary Institute of Ecosystem Studies, Baltimore City Public Schools, and George Washington University (**NSF 1721163, subcontract \$263,000**) to develop and research instructional materials that engage students in scientific practices and integrate earth science content within the high school chemistry curriculum to support three-dimensional teaching and learning. **Role: PI** (subcontract) (Cary Institute, PI: A. Berkowitz; Baltimore City Public Schools, PI: J. Gabrielse).
- 4/2017 – 7/2021 *STEM Teaching Excellence in High Need Schools: Teacher Preparation in the Nation's Capital.* This four-year, National Science Foundation – Noyce project (**NSF 1660690, \$1,496,905**) brings together faculty from the GW Graduate School of Education and Human Development with faculty from the Columbian College of Arts and Science, to recruit and support STEM majors in becoming secondary STEM teachers in high need settings within the District of Columbia. **Role: Co-PI.** (PI: L. Medsker; Co-PIs: D. Ulman, **J. Grooms**, L. McClary, T. Sikorski)

- 3/2017 – 3/2022 *Mentored Experience to Expand Opportunities in Research version High School.* This five-year project, supported via subcontract in collaboration with Children’s National Hospital Research Institute, funded by the National Institute of Health (**NIH R25HD090722, subcontract \$143,552**), will provide opportunities for high school STEM teachers to participate in authentic scientific research experiences and be supported through graduate coursework to translate those experiences into educative learning opportunities for their students through curriculum development and implementation. **Role: Co-PI** (subcontract) (PI: N. Luban, S. Teach; Subcontract, PI: C. Pyke; Co-PI: **J. Grooms**)
- 9/2016 – 9/2018 *DC FUSION Professional Development Consortium.* This two-year project supported by the DC Office of the State Superintendent of Education (**subcontract \$14,813**) is a collaborative effort between Catholic University of America, Trinity University, Howard University, and George Washington University to form a professional development consortium to work with local education agencies (LEA) to identify potential areas of need and support those LEAs with targeted professional development.
- 8/2016 – 12/2019 *Charles E. Smith Jewish Day School Integrated STEM Curriculum Development.* This three-year, sponsored project (Private Donor) brings together GWU STEM education faculty and CESJDS K-5 faculty to develop and pilot test a new integrated STEM curriculum, centered on the crosscutting concepts of science and enhanced through continued emphasis across other disciplines including English language arts, social studies, Hebrew, and Judaic studies. **Role: Co-PI.** (PI: T. Sikorski; Co-PIs: **J. Grooms**, C. Pyke)

Project Evaluation and Consulting

- 8/2017 – 7/2020 *X-Labs: Cross-Disciplinary Practice Focused Undergraduate Laboratory Transformation for Biology, Chemistry and Physics.* This three-year, National Science Foundation sponsored project (**NSF 1725655**) will transform undergraduate laboratory courses at East Carolina University by infusing scientific practices into classroom instruction through the implementation of the Argument-Driven Inquiry instructional model. **Role: Project Evaluator** (PI: J. Walker)
- 8/2017 – 7/2020 *Collaborative Research: Asynchronous Discussions to Engage Students in Scientific Argumentation.* This three-year, National Science Foundation sponsored project (**NSF 1712211**) will explore how students engage and frame asynchronous discussions and argumentation in an online context. The project takes place at East Carolina University and Illinois State University. **Role: Project Evaluator** (PI: K. Callis-Duehl, ECU; PI: R. Gougis, ISU)
- 7/2016 – 7/2019 *Investigating the Effects of Socioscientific Argumentation Development on Student Academic Success.* This three-year, National Science Foundation sponsored project (**NSF 1623371**) seeks to reform the undergraduate STEM

laboratory courses at Bethune-Cookman University to emphasize scientific argumentation and support students in applying argumentative reasoning to socioscientific issues related to their local context. **Role: Consultant** (PI: H. Torres)