

DR. MASON A. KUHN
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Education

University of Northern Iowa Ed.D. (December, 2015)
Cedar Falls, Iowa

Curriculum and Instruction
Dissertation Chair: Dr. Elana Joram

Dissertation Topic: Do Teacher Judgment Accuracy and Teacher Feedback Predict Student Achievement in Elementary and Middle-School Science?

Coursework Focus: Instructional Psychology, Cognitive Learning, Creativity, Arts-Integrated Inquiry, Quantitative Research, Curriculum Development.

University of North Dakota M.S. (July, 2011)
Grand Forks, North Dakota
Special Education

Walden University M.S. (May, 2009)
Minneapolis, Minnesota
Science Education K-8

Coe College B.A. (May, 2000)
Cedar Rapids, Iowa
Elementary Education K-6
Physical Education
Coaching Certificate

Professional Experience

Educational Experience

2015-Present. *Assistant Professor*, University of Northern Iowa.
Curriculum and Instruction: Elementary Education Division
Undergraduate Courses Taught:
ELEMECML 3161-Teaching Elementary School Science.
ELEMECML 4150 Elementary Curriculum
ELEMECML 3120 Classroom Management
Graduate Courses Taught:
ELEMECML 5141 Integrated Activities in Elementary School
Science and Mathematics
ELEMECML 7352 Curriculum Theory and Development
INTDEPED 7326 Integrating Theory

Other Teaching Positions

2008 – 2015. *4th Grade Classroom Teacher*. Shell Rock Elementary. Shell Rock, Iowa. License: Master Educator License

2012 *Adjunct Professor*. Wartburg College. Waverly, Iowa
Course Taught: PHY 130 -Physics of Ordinary Things.

2006 – 2008. *3rd Grade Classroom Teacher*. Washington Elementary, Charles City, IA.

2005-2006. *4th Grade Classroom Teacher*. King-Chavez Academies, San Diego, CA.

2000-2005. *5th Grade Classroom Teacher*. Eckert Intermediate School, Houston, TX.

2006-2015 *Athletic Coach*. Head basketball coach 9th grade boys (2006-2007), Sophomore boys (2007-2008) Charles City Iowa. 7th grade boys basketball coach (2008-2015) Waverly, Iowa.

Administrative and Other Professional Experiences

2021-Present

Professional Development School Partnership Coordinator, Cunningham Elementary School.

Organized and coordinated a new PDS partnership where EMECML 3164, EMECML 3161, EMECML 4150, LITED 3116, and Math 3203. The courses were taught by Dr. Robin Dada, Dr. Irene Walker, Dr. Sarah Vander Zanden, Dr. Chepina Rumsey, and Dr. Mason Kuhn. In this PDS students are enrolled in all five classes and meet at Cunningham Elementary five days a week. Students teach every day and have multiple opportunities to reflect and develop lesson plans.

2016-Present

Professional Development School Partnership Coordinator, Irving Elementary School.

Organized and taught a Professional Development School Model in Fall 2016 and am scheduled for Spring 2017. Pre-service students are enrolled in EMECML 4150 Elementary Curriculum and EMECML 4123 Methods of Teaching Visual and Performing Arts Integration in the Elementary Classroom. Students learn about various aspects of research-based curriculum development and teach arts-integrated lessons at Irving Elementary in Waterloo, Iowa.

Honors and Awards

2022 *Apple Polishers Award*. The Student Alumni Ambassadors (SAA) sponsors the awards each year to honor UNI faculty and staff members for their educational encounters and contributions to the University and the student body.

Nominated by:

- Sammy Hackbart

2020 College of Education. Outstanding Faculty Awards: Teaching Award.

2019 *Apple Polishers Award*

Nominated by:

- Bryce Cox

2017 Iowa Academy of Education Outstanding Doctoral Dissertation Award

2017 Dissertation of the Year. University of Northern Iowa.

2017 *Apple Polishers Award.*

Nominated by:

- Mercedes Steffenson
- Hunter Flesch
- Kris Miranda
- Katie Schlawin

2015 *The Young Distinguished Alumni Award.* Coe College. Cedar Rapids, Iowa.

The Young Alumni Award is an honor which the college bestows on its alumni who are within 15 years of graduation for their service. The following criteria are used to be considered for this award:

1. Distinction in a professional field of endeavor
2. Loyalty to Coe is measured in volunteer service to the Alumni Association or related activities (Admission assistance, career assistance, alumni events, Board of Visitors Alumni Council, or Coe Fund). Current members of Coe's Board of Trustees, Board Visitors or Alumni Council cannot receive this award while serving their term.
3. Volunteer service to the community in which the nominee resides

2015 *Teacher of the Week. 93.5 The Mix.* Cedar Falls, Iowa.

Sponsored by University Book and Supply, Stuff etc., Cedar Valley Stand for the Silent, Little Caesars Pizza, Roling Ford, Waterloo Center for the Arts.

2012 *The Presidential Award in Excellence in Math and Science Teaching.* Washington, D.C.

The Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST) are the highest honors bestowed by the United States government specifically for K-12 mathematics and science teaching.

2005 *Aldine Independent School District Extra Miler Award.* Houston, Texas

Recognition given to teachers in the Aldine Independent School District who display exemplary work ethic and find creative and effective ways to meet the needs of their students.

2004 *Eckert Intermediate Above and Beyond Teacher of the Year.*
Houston, Texas.

Annual award that recognizes the teacher who possess the energy to withstand a taxing schedule to inspire students of all backgrounds and abilities to learn.

2002 *Aldine Independent School District Council of the PTA's Educator of the Year.* Houston, Texas.

The recognition is intended to recognize individual teachers for sustained performance of excellence in teaching that incites intellectual curiosity in students.

Research Experience and Scholarly Activities

Publications

Rinehart, R., Kuhn, M. (Under Review). Building better questions: Three dialogic strategies to promote students' scientific thinking. *Science and Children*.

Kuhn, M. (2022). Using the Heuristic Investigation Delayed Evidence (HIDE) Method to Improve Students' Ability to Reason Through Sourcing. *Journal of Emergent Science*. 1(22). P. 21-33.

Rinehart, R., Oleson, B., Freese, L. & Kuhn, M. (2021). Mission Cognition: Students Undertake a Mission to Mars. *Science and Children*. 58(3). P. 43-49

Kuhn, M., Pepanyan, M., & Tallakson, D. (2020). Executive Function Improvement of Students With Adverse Childhood Experiences After an Art-Integration Program. *Journal for Learning through the Arts*, 16(1).

Rinehart, R., Kuhn, M., & Milford, T. (2020). The relationship of epistemic cognition and dialogic feedback in elementary and middle school science classrooms. *Research in Science & Technological Education*. DOI: 10.1080/02635143.2020.1799779.

Kuhn, M., Tallakson, D., Schweinfurth, M. (2020). Pre-service Teachers Perceptions of At-Risk Students' Academic Ability in an Arts-Based Inquiry Professional Development School. *PDS Partners: Bridging Research to Practice*.(15)1.

- Kuhn, M. & Pepanyan, M. (2020). Digging Deeper into Dialogic Feedback: Evaluating How Science Teachers Manage Uncertainty as a Predictor of Students' Ability to Construct an Epistemically Sound Argument. *World Journal of Educational Research*. 1(7).
- Teske, J., Clausen, C. K., Gray, P., Smith, L. L., Al Subia, S., Rod Szabo, M., Kuhn, K., Gordon, M., & Rule, A. C. (2017). Creativity of third graders' leadership cartoons: Comparison of mood-enhanced to neutral conditions. *Thinking Skills and Creativity*. (23). 217-226.
- McDermott, M. & Kuhn, M. (2017). Introducing the ASSIST Approach to Pre-Service STEM Teachers. *Innovations in Science Teacher Education*. 1(2)..
- Kuhn, M., & McDermott, M. (2017). Using Argument-Based Inquiry Strategies for STEM-Infused Science Teaching. *Science and Children*, 54(5), 80.
- Kuhn, M., Greenhalgh, S., & McDermott, M. (2016). Using Creativity from Art and Engineering to Engage Students in Science. *Journal of STEM Arts, Crafts, and Constructions*, 1(2), 2.
- Kuhn, M. (2016). Meta-Sticks: Having Children Consider the Source of Knowledge Promotes Scientific Thinking. *Science and Children*. 53 (8). 32-35.
- Kuhn, M. (2015). Using Student Knowledge to Enhance Inquiry: A Theoretical and Practical View of Negotiation in a Science Classroom. *The Journal of Educational Enquiry*. 14 (3). 37-50.
- Kuhn, M. (2015). Shut Up and Listen! How Experiences as a Learner and a Culture Shock Shifted my Focus of Teacher Knowledge in a Science Classroom. *The Qualitative Report*, 20 (11), 1765-1771.
- Kuhn, M. (2015). Encouraging Teachers to W.A.I.T Before Engaging Students In Next Generation Science Standards STEAM Activities., *The STEAM Journal*: 2 (1).
- Teske, J. K., Gray, P., Kuhn, M. A., Clausen, C. K., Smith, L. L., Alsubia, S. A., Ghayoorad, M., Rule, A. C., & Schneider, J. S. (2014). Teacher-made tactile science materials with critical and creative thinking activities for learners including those with visual impairments. *ERIC Document System No. ED547679*.
- McDermott, M. & Kuhn, M. (2012). Developing "Science Literacy Literate" Elementary Teachers with the Science Writing Heuristic Teaching Approach. *Science Teacher Education*. 65
- Kuhn, M. & McDermott, M. (2012). Negotiating the Way to Inquiry: Encouraging

negotiation early in the year promotes scientific communication. *Science and Children*. 50 (9) p. 52-57.

McDermott, M. & Kuhn, M. (2012). Communicating Like a Scientist with Multimodal Writing. *Teaching Science*, 58 (2): 53 – 55.

McDermott, M., & Kuhn, M. (2011). Utilizing Writing for Alternative Audiences in a College Integrated Science Course, *Journal of College Science Teaching*, 41(1): 40 – 45.

Book Chapters

Kuhn, M., McDermott, M., & Quarderer, N. (2019). Current and Future Visions of Inquiry in Science Curriculum. In Akpan, B. (Eds), *Science Education: Visions of the Future*. Next Generation Education.

Editor-Reviewed Publications

Kuhn, M. (2014). What We Have Here is a Failure to Communicate: Evaluating Negotiation in an Elementary Science Classroom. *California Classroom Science*. Vol. 26 No. 8.

Technical Reports

Montgomery, S., & Kuhn, M. (2016). *Annual Program Review Report for MAE in Elementary Education Program*. Department of Curriculum & Instruction, University of Northern Iowa.

Professional Presentations

National/International Presentation

Kuhn, M., Rinehart, R., & Milford, T. (2022, March). *The Role of Responsibility Intellectual Virtues in Science Learning*. The National Association for Research in Science Teaching (NARST). Vancouver, British Columbia.

Kuhn, M., Rinehart, R. & McDermott, M. (2022, Jan.). *A Storyline Unit Anchored in Phenomenon for Elementary Preservice Teachers and an Evaluation of their Pre / Post Pedagogical Views*. Association for Science Teacher Education Conference (ASTE). Greenville, North Carolina.

Walker, I, Dada, R., Kuhn, M., Rumsey, C., Vander Zanden, S., (UNDER REVIEW 2022, *Faculty and Preservice Teacher Experience in an Embedded School University Partnership: Learning about Race, Culture and Achievement in Underperforming Schools*. The American Association of College for Teacher Education Annual Meeting

New Orleans, LA.

- Kuhn, M., Tallakson, D., Pepanyan, M. & Schienwerf, M. (2020, Apr 17 - 21) *Measuring Executive Function Skills of Students With Adverse Childhood Experiences After an Art-Integration Program* [Paper Session]. AERA Annual Meeting San Francisco, CA <http://tinyurl.com/su9kb4g> (Conference Canceled)
- Kuhn, M., Rinehart, R. W., Pepanyan, M., Milford, T. & McDermott, M. (2020, Apr 17 - 21) *Elementary Students' Approaches to Uncertainty Resolution in Classrooms With Contrasting Methods for Managing Argumentation* [Paper Session]. AERA Annual Meeting San Francisco, CA <http://tinyurl.com/ul6r23l> (Conference Canceled)
- Kuhn, M. & Pepanyan, M. (2020, January). *Teachers' Dialogic Feedback Patterns as a Predictor of Student Achievement on Critical Thinking Assessment*. The Association for Science Teacher Education Conference (ASTE). San Antonio, Tx
- McDermott, M., Kuhn, M., Bae, Y., B., Ding, C., Carney, C., Hansen, W. (2020, January). *Impact of Engagement with the ASSIST Approach on Pre-service Elementary Teachers*. The Association for Science Teacher Education Conference (ASTE). San Antonio, Tx.
- Atwood-Blaine, D. & Kuhn, M. (2020, January). *Pilot Study: Teaching Elementary Science Methods within a PDS Approach*. The Association for Science Teacher Education Conference (ASTE). San Antonio, Tx.
- Kuhn, M., Rinehart, R., & Milford, T. (2019, April). *The Role of Dialogic Feedback and Epistemic Cognition in Promoting Evidence-Based Argumentation in Science*. American Educational Research Association (AERA). Division C - Learning and Instruction. Section 1d: Science. Toronto, ON.
- Kuhn, M., Tallakson, D., Pedersen, J., Buzynski, J., Cox, B., Wilson, K. (2019, February). *A Unique PDS Model: Using Arts-Integration With Elementary Students Who Have High Adverse Childhood Experiences*. National Association For Professional Development Schools (NAPDS). Atlanta, GA.
- McDermott, M; Bedward, J.; Weiss, K.; Quarderer, N. & Kuhn, M. (2019, January). *Comparing Engagement with the ASSIST Approach in Pre-Service and In-Service Teacher Programs*. The Association for Science Teacher Education Conference (ASTE). Savannah, GA.
- Atwood-Blaine, D. & Kuhn, M.. (2019, January). *Home-Grown Primary Science: Developing District-wide K-2 Science Teachers and Curriculum Aligned to NGSS using the ASSIST Approach*. The Association for Science Teacher Education Conference (ASTE). Savannah, GA.

Kuhn, M. & McDermott, M. (2019, January). *Wake up Your Brain: An Activity Designed to Help Pre-Service Elementary Science Teachers Engage in Argumentation*. The Association for Science Teacher Education Conference (ASTE). Savannah, GA.

Tharp, B. & Kuhn, M. (2018, January). *Using the Growth Mindset to Improve Opportunities for Negotiation in Argument-Based Inquiry Elementary Classrooms*. The Association for Science Teacher Education Conference (ASTE). Baltimore, MD.

Quarderer, N. & Kuhn, M. (2018, January). *Model Development Using the ASSIST Approach*. The Association for Science Teacher Education Conference (ASTE). Baltimore, MD.

Kuhn M. (2017, April). *A Response to Intervention Model for Argument-Based Inquiry: The Importance of using Student Writing to Find out What They Really Know*. National Science Teacher Association (NSTA). Los Angeles, California.

Kuhn M. & McDermott, M. (2017, April). *The Relationship Between Dialogic Teacher Feedback and Student Outcomes on Standardized Science Assessment*. The National Association for Research in Science Teaching (NARST). San Antonio, Texas.

Kuhn, M. & McDermott, M. (2017, January). *How teacher confidence to facilitate Student-driven negotiation is impacted by participation in PLC Groups and Summer Workshop Experiences*. The Association for Science Teacher Education Conference (ASTE). Des Moines, Iowa.

Kuhn, M. (2016, July) *Investigation or Model: Two Argument-Based Inquiry Approaches to the NGSS*. National Science Teacher Association 2016 STEM Forum & Expo (NSTA). Denver, Colorado.

McDermott, M. & Kuhn, M (2016, April). *Using the ASSIST Approach (Argument-Based Strategies For STEM Infused Science Teaching) in an Elementary Classroom*. The National Science Teacher Association (NSTA). Nashville, Tennessee.

McDermott, M, Graf, K, Kuhn, M. (2016, January), *The Argument-based Strategies for STEM Infused Science Teaching (ASSIST) Approach – Initial Teacher Perceptions and Implementation Challenges*. The Association for Science Teacher Education Conference (ASTE). Reno, NV.

McDermott, M., Hand, B., Kuhn, M., (2015, January). *Instituting a Teacher Led Professional Development to Improve Argument Based Instruction*. The

Association for Science Teacher Association (ASTE). Portland, OR.

Kuhn, M. (2015, March). *Meta-Sticks: A Novel Way to Promote Negotiation in the Classroom*. The National Science Teacher Association (NSTA). Chicago, Illinois.

Regional, State, and Sectional Presentations

Kuhn, M., & Rinehart, R. (2021, October). *Introducing the Revised ASSIST Approach*. Science Teaching Section/ Iowa Council of Teachers. of Mathematics (ISTS-ICTM) Fall Conference. West Des Moines, Iowa.

Kuhn, M. Tallakson, D. & Schienwerf, M. (2019, November). *Using Arts-Based Inquiry and Mindfulness Practices to address Executive Function Deficiencies of Students Exposed to Multiple Adverse Childhood Experiences (ACEs)* Education Summit. University of Northern Iowa. Cedar Falls, Iowa

Kuhn, M. & Rinehart, R. (2019, October). *Improving Students' Science and Engineering Practices (SEP) by focusing on Executive Function Skill Development*. Science Teaching Section/ Iowa Council of Teachers. of Mathematics (ISTS-ICTM) Fall Conference. West Des Moines, Iowa.

Kuhn, M. & Atwood-Blaine, D. (2019, October). *The ASSIST Approach: Using Inquiry as a Learning Tool and Outcome*. Science Teaching Section/ Iowa Council of Teachers. of Mathematics (ISTS-ICTM) Fall Conference. West Des Moines, Iowa.

Atwood-Blaine, D. & Kuhn, M. (2018, October). *Considering the Crosscutting Concepts*. Science Teaching Section/ Iowa Council of Teachers. of Mathematics (ISTS-ICTM) Fall Conference. West Des Moines, Iowa.

Kuhn, M. & Atwood-Blaine, D. (2018, October). *The Storyline Approach: Building Coherent Unit Plans with the ASSIST Approach*. Science Teaching Section/ Iowa Council of Teachers. of Mathematics (ISTS-ICTM) Fall Conference. West Des Moines, Iowa.

Kuhn, M. & Greenhalgh, S. (2018, May). *Shake it up! An Engineering Challenge for College Students and 4th Graders*. Technology & Teaching and Learning Conference. Cedar Falls, Iowa.

McGrane, K. & Kuhn, M. (2018, March). *Engaging Students With Creative Ways to Learn Science Vocabulary*. STEM Pre-Service Teacher Conference. Coralville, Iowa.

Kuhn, M. & Atwood-Blaine, D. (2017, October). *Using the Initial Engagement Activity as a Phenomena-Based Instruction*. Science Teaching Section/ Iowa Council of Teachers. of Mathematics (ISTS-ICTM) Fall Conference. West Des Moines, Iowa.

Kuhn, M. & Tallakson, D. (2017, March). *Professional Development School in the*

- Waterloo Community School District*. Iowa Association of Colleges of Teacher Education Conference. Cedar Falls, Iowa.
- Kuhn, M. (2017, March). *Using Math, Technology, & Engineering to Help Students Better Understand Science Concepts in an Integrated STEM Model*. STEM Pre-Service Teacher Conference. Coralville, Iowa.
- Reed, T. & Kuhn, M. (2016, October). *Making Assessment Meaningful: A Cumulative Project Where Pre-Service Teachers Create Unit Plans Aligned to the Next Generation Science Standards*. Science Teaching Section/ Iowa Council of Teachers. of Mathematics (ISTS-ICTM) Fall Conference. West Des Moines, Iowa.
- Kuhn (2016, March). *Using Dialogic Feedback to Moderate the Relationship Between Knowledge of Learners and Student Performance on Assessment*. Education Summit. University of Northern Iowa. Cedar Falls, Iowa
- Kuhn, M. (2015, November). *Using an Argument-Based Inquiry Approach to Address Difficult to Teach NGSS Standards*. STEM Pre-Service Teacher Conference. Coralville, Iowa.
- Kuhn, M. (2015, September). *Developing a “Cognitively Safe” Classroom*. Iowa Academy of Science Iowa Science Teaching Section/ Iowa Council of Teachers. of Mathematics (ISTS-ICTM) Fall Conference. West Des Moines, Iowa.
- McDermott, M.; Graf, K.; Kuhn, M. (2015, September). *Argument-Based Strategies For STEM Infused Science Teaching- The ASSIST Approach*. Iowa Academy of Science Iowa Science Teaching Section/ Iowa Council of Teachers. of Mathematics (ISTS-ICTM) Fall Conference. West Des Moines, Iowa.
- Kuhn (2015, April). *Maintaining a Growth Mindset in a Data Driven World*. Make Teaching Your Masterpiece Conference. Iowa City, Iowa.
- Kuhn (2015, May). *Developing Scientifically Literate Children: From Theory to Practice*. Educational Summit on STEM, Literacy and Rural Education, University of Northern Iowa. Cedar Falls, Iowa.
- Rule, A. C., Schneider, J. S., Clausen, C. K., Gray, P., Kuhn, M., Smith, L., & Teske, J. (2014, October). *Teacher-made tactile science materials for gifted learners with visual impairments*. Iowa Talented and Gifted (ITAG) Annual Conference: Reaching for the Future. Airport Holiday Inn, Des Moines, Iowa.
- Kuhn, M. (2014, October) *Meta-Sticks: Enhancing Classroom Negotiation through Student Evaluation of Evidence*. Iowa Academy of Science Iowa Science Teaching Section/ Iowa Council of Teachers. of Mathematics (ISTS-ICTM) Fall Conference. Ames, Iowa.
- Kuhn, M. (2014, July). *The Science Writing Heuristic: Engaging Students with Classroom Negotiation*. Iowa Family and Consumer Sciences Educators Conference Fall Conference. Cedar Rapids, Iowa.

Elser, C., Corkery, S., Kuhn, M. (2014, June). *Parent Perspectives of Inclusion*. Midwest Summer Institute: Inclusion and Communication for All. University of Northern Iowa. Cedar Falls, Iowa.

Kuhn, M. (2014, April). *The Role of Negotiation in Inquiry*. Science Education Update Conference. University of Northern Iowa. Cedar Falls, Iowa.

McDermott, M. & Kuhn. (2012, April). *Collaboration of College and Elementary Students to Achieve Understanding*. Science Writing Heuristic Conference. West Des Moines, Iowa.

McDermott, M. & Kuhn, M. (2011, October). *Using Multimodal Writing Tasks in Science Classrooms*. Presentation at Iowa Academy of Science Iowa Science Teaching Section (ISTS) Fall Conference. Ames, IA.

McDermott, M., Kuhn, M. (2010, October) *Developing Pre-Service Elementary Education Science Courses through Collaboration with Practicing Teachers*. Iowa Science Teachers Conference, Ames, IA:

Plenary Speaker

Kuhn, M. (2015, April). The Importance of Being a Scientifically Literate Citizen. Coe College Educational Symposium. Cedar Rapids, Iowa.

Local Presentations

Kuhn, M. (2019, September). Sample Lesson for Future Teachers. Be a Teacher Day.

Kuhn, M. (2018, October). Leadership at UNI. Leadership Workshop Scenario.

Kuhn, M. (2018, October). Report on Research. Center for Educational Transformation National Advisory Council.

Freedman, S., Hecimovich, M., Kuhn, M., Petersen, A. (2018, October). Research Advice for New Faculty. New College of Education Faculty Orientation.

Kuhn, M. (2018, October). An Argument-Based Inquiry Research Project Using a Mixed Methods Approach. INTDEPED 7326 Research into Theory. Dr. Deb Tidwell.

Kuhn, M. (2018, August). Introduction to Instruction Aligned to the Next Generation Science Standards. Training for Americorps Teachers.

Kuhn, M (2018, July). Helping Pre-Service Teachers Think about Conservation and Sustainability. Guest Speaker at the Center for Energy & Environmental Education Administration Meeting.

Kuhn, M. (2017, September). Research in Argument-Based Inquiry: From Theory to Practice. INTDEPED 7389 - Seminar in Integrating Theory with Practice. Dr. Audrey Rule.

Kuhn, M. (2017, September). Service Dogs in the Classroom. TEACHING 4170. Human Relations: Awareness and Application. Katy Oakland.

Professional Development Activities/Workshops

June 2014. *Waverly-Shell Rock Professional Development*. Primary Investigator/designer/implementer of a three-day professional development for twenty-five K-8 teachers in the WSR school district. The professional development focused on the aspect of negotiation as a learning tool in science classrooms.

June 2013. *Waverly-Shell Rock Professional Development*. Designed and implemented training for fifty teachers from Waverly-Shell Rock, and Janesville School District. Professional development revolved around introducing teachers new to SWH. Further work included creating a website where SWH lessons aligned to the Next Generation Science Standards were created. www.waverlyshellrockswh.weebly.com.

June 2012. *Waverly-Shell Rock Professional Development*. Designed and implemented training for sixty-five teachers from Waverly-Shell Rock, Waterloo, and Janesville School District. Professional development revolved around introducing teachers new to SWH and the pedagogical concepts of the approach.

June 2011. *Waverly-Shell Rock Professional Development*. Designed, implemented, and providing follow up training for ten elementary science teachers using the SWH teaching approach in the Waverly-Shell Rock District.

Grants, Scholarships, and Fellowships Funded

Graduate College Summer Fellowship. “Two Key Issues Facing Elementary Science Curriculum.” (Funded for \$3,800 - Summer 2022). The aim of this project is to address two critical issues affecting elementary science instruction in the state of Iowa. The issues that will be highlighted in this application are *availability* of classroom time to teach high quality science curriculum and providing opportunities for students to engage in the *process* of science as part of their learning experience. In the sections below an overview of each of these issues will be presented followed by specific ways we will address each one through methods and timelines, followed by a plan to disseminate the findings both statewide and nationally.

Veridian Community Engagement & College of Education Dean's Fund for Excellence Fellowship Awards Committee. "Building Resilience to Trauma through Mindfulness and the Arts." (Funded for \$500 - Spring 2019)

Role: Co-Primary Investigator, Co-Scholarship Writer: The goal of this project is to help a local school that has a high number of minority students who live below the poverty line and recently were recognized as a Trauma-Informed School status due to the fact that a significant percentage of students scored high on an Adverse Childhood Experience (ACE) measure. Students will meet with the researchers before school 3 days a week and engage in mindfulness meditation along with arts-based inquiry tutoring in areas that their teachers indicate they are deficient in.

Faculty Summer Scholarship. "The Relationship Between Epistemic Cognition and Dialogic Feedback on Student Achievement on Standardized Science Assessment." (Funded for \$4,000 - Summer 2018)

Role: Primary Investigator, Scholarship Writer: The purpose of this project is to explore the association between elementary and middle-school science teacher views of how knowledge is created, their ability to utilize dialogic feedback, and how those variables predict student achievement on standardized science assessment.

Dean's Endowed Fund (Funded for \$5,960 - Summer 2017).

Role: Co-Primary Investigator, Grant Writer: The goal of this grant is to create a Professional Development School (PDS) partnership with Irving Elementary in the Waterloo Community School District with two courses of dual-enrolled pre-service teachers at the University of Northern Iowa. This grant expanded on the work from the Meyer-Janssen Endowed Research Fund Grant (2016) which started our Professional Development School (PDS) with Irving Elementary in the Waterloo Community School District. With this grant we added four more teachers to our original cohort.

Math and Science Partnership Grant (MSP). "Increasing Primary School Teachers' Understanding of the Iowa Science Standards and Developing K-2 Science Curriculum Using the ASSIST Approach Framework." (Funded for \$250,000 for 16 Months- Summer 2017-Fall 2018)

Role: Co-Primary Investigator, Grant Writer: The goal of this Iowa Mathematics and Science Partnership Title II-B Grant is to support Kindergarten - 2nd Grade teachers in the Waterloo Community School District as they attempt to improve the overall science learning of their students by delivering instruction aligned to the new Iowa Science Standards (based on the Next Generation Science Standards). Teachers will attend a five-day professional development where they will learn how to implement the Argument-based Strategies for STEM Infused Science Teaching (ASSIST) Approach.

Center for Educational Transformation (Implementation Funding). "The Enhancement of the Argument-based Strategies for STEM Infused Science Teaching (ASSIST) Approach Through Dialogic Teacher Feedback, as Measured By the Dialogic Feedback Teacher Observation Tool (DFOT)" (Funded for \$150,000 - 2016-2018).

Role: Primary Investigator, Grant Writer: The goal of this Center for Educational Transformation (CET) Implementation Funding Grant is to support teachers in dealing with an instructional issue they frequently face when attempting to implement reform-based teaching approaches in science. Specifically, the research will focus on the type of feedback teachers provide their students when they teach science using an argument based, STEM-infused approach. We are interested in exploring possible correlations between the type of feedback a teacher uses in their classroom and their epistemological beliefs about science. We will evaluate how student achievement is affected by teacher epistemological beliefs about science and their ability to enact quality dialogic feedback.

Meyer-Janssen Endowed Research Fund Grant. “The Development of a Professional Development School Through Arts-Infused-Inquiry-Based-Learning to Improve Pre-Service Students’ Understanding of Cultural Competence” (Funded for \$10,000; 2016).

Role: Co-Primary Investigator, Grant Writer: The goal of this grant is to create a Professional Development School (PDS) partnership with Irving Elementary in the Waterloo Community School District with two courses of dual-enrolled pre-service teachers at the University of Northern Iowa. To help create a positive experience for the UNI pre-service teachers we plan to train the in-service partners in Arts-Infused-Inquiry-Based-Learning (AIIBL). Prior PDS experiences with AIIBL trained teachers have produced improved student engagement and positive attitudes towards “At-Risk” students by pre-service teachers.

College of Education Summer Enhancement Fellowship. “The Development of an Arts-Infused-Inquiry-Based Learning (AIIBL) Curriculum Through a Professional Development School Partnership With Irving Elementary.” (Funded for \$3,500; 2016).

Role: Primary Investigator: The purpose of this fellowship was to create a PDS model with a section of Elementary Curriculum and Methods of Teaching Visual and Performing Arts Integration in the Elementary Classroom with a group of teacher at Irving Elementary in the Waterloo Community School District.

Submitted Proposals

National Science Foundation. Discovery Research PreK-12 (was not funded)

Role: Co-Primary Investigator: The current emphasis on high stakes literacy assessments have left public preschool through second grade (P-2) classrooms devoid of STEM in a mistaken belief that children must learn to read before they can read to learn. CISTEML addresses a critical need for P2 STEM through a professional development (PD) framework that assists teachers in recognizing the benefits of including STEM through the addition of STEM centers that operate alongside their existing literacy centers. These centers will provide a context for implementing argument-based, STEM infused teaching and learning practices that address the Next Generation Science Standards (NGSS) in a manner that is intellectually rigorous, highly captivating to

children, and grade-level and/or individual appropriate. This framework will guide teachers in integrating planned and child-driven, inquiry-based STEM investigations seamlessly into the instructional day in ways that will support children's learning in multiple domains, including approaches to learning.

Consulting

Moving beyond pedagogy: Developing elementary teachers' adaptive expertise in using the epistemic complexity of science. National Science Foundation (NSF). Funded for \$1,438,104. Consultant to PI Dr. Brian Hand (University of Iowa). The Discovery Research K-12 program (DRK-12) seeks to significantly enhance the learning and teaching of science, technology, engineering and mathematics (STEM) by preK-12 students and teachers, through research and development of innovative resources, models and tools (RMTs). Projects in the DRK-12 program build on fundamental research in STEM education and prior research and development efforts that provide theoretical and empirical justification for proposed projects. The project will work with 150 Grade 3-5 teachers in Iowa and Alabama to implement a three-year professional development program to assist teachers develop adaptive expertise. Through implementation of an argument-based inquiry approach focused on development of adaptiveness, teachers will be supported as they shift their expertise from routine to adaptiveness.

Improving Teacher Quality State Grant Program (Title IIA). "Improving Student Science Learning through the Argument-based Strategies and STEM Infused Science Teaching (ASSIST) Approach" (Funded for \$472, 271; 2015-2017). Consultant to PI Dr. Mark McDermott. Several school districts will employ STEM infused argument-based teaching strategies by first training a cohort of mentor teachers. The mentor teachers will then serve as teacher-leaders as the professional development expands to include more teachers.

Inquiry into Inquiry: Improving Elementary Pre-Service Teacher Education at Wartburg College - Strategic Initiative Fund Living Our Learning; Claiming Our Calling; Transforming Tomorrow Grant (Funded for \$5,000; 2012) Consultant with Dr. Mark McDermott and Dr. Kathy Book. designed to implement the SWH teaching approach in science and social studies courses at Waverly-Shell Rock School District. Grant provided funding for summer and school year professional development.

Iowa Math and Science Partnership (MSP) Title II Grant (Funded for \$416,501 June 2010 – September 2012) Consultant with PIs Dr. Mark McDermott, Dr. Brian Hand, staff at AEA 267, and the Waterloo Community School District on grant investigating the use of the Science Writing Heuristic teaching progression in combination with multimodal writing tasks over the course of three years in K – 12th grade science classrooms.

Service

National

Guest Editor. (2021). Instructional Science. Reviewed manuscripts for an International Journal of the Learning Sciences promotes a deeper understanding of the nature, theory, and practice of learning and of environments in which learning occurs.

ASTE Conference Proposal Reviewer. (2021). Reviewed conference proposal the Curriculum, Pedagogy and Assessment thread at the 2020 International Conference (Greenville, SC).

ASTE Conference Proposal Reviewer. (2019). Reviewed conference proposal the Curriculum, Pedagogy and Assessment thread at the 2020 International Conference (San Antonio, TX).

ASTE Conference Proposal Reviewer. (2018). Reviewed conference proposal the Curriculum, Pedagogy and Assessment thread at the 2019 International Conference (Savannah, GA).

ASTE Conference Proposal Reviewer. (2017). Reviewed conference proposal the Curriculum, Pedagogy and Assessment thread at the 2018 International Conference (Baltimore, MD).

Book Reviewer NSTA Press (2015). Reviewed various manuscripts for the NSTA Press, which includes evaluating the NSTA Proposal Questionnaire; Introduction; TOC sample chapters; and author CVs.

Associate Editor, The Journal of STEM Arts, Crafts, and Constructions (2015). Duties include: Manage the review process of 3-4 manuscripts per year- in doing so, one must locate 2-3 reviewers for each manuscript and then examine the reviews that come back to make recommendations. All reviews plus the recommendation are then sent to the Editor-in Chief, along with the names, emails, and affiliations of the reviewers. Promote the journal by telling colleagues and students about it via social media and suggesting to appropriate persons that they might submit their work. Submit a manuscript or editorial of your own as time or appropriateness permits.

State, Regional, or Sectional

Pre-service / In-service STEM teacher conference (2021). Committee Planner.

Iowa Science Leadership Team Member (2016-2019). Communities of Learning Committee.

Mentor to candidates for the Presidential Award in Excellence in Science and Math Teaching (2016-2019). Elementary Science Candidates.

Iowa Governor's North East Region STEM Advisory Council Member (2015-Current). Standards Committee.

Iowa Outstanding Educators Committee (2015). Make Teaching Your Masterpiece, a conference for third year education majors, and 1st - 3rd year teachers.

Iowa Governor's North East Region STEM Advisory Council Member (2014). Standards Committee.

Guest Lecturer (2014). Coe College. Educational Foundations. Constructivism, Nominal Grouping Technique, and Argument-Based Inquiry.

Guest Lecturer (2014). Coe College. Human Relations. Multiculturalism: experience coming from a non-diverse environment and being a first-year teacher in Houston, Texas.

Guest Speaker (2014). The Benefits of a Service Dog. Champions for Autism fundraiser. July 12. Waterloo, Iowa.

Founder and Director Shell Rock Science Club (2007-2014). After school club where students design science projects, collect data, negotiate meaning, and publish findings on a display board that is judged by faculty.

Guest Lecturer (2012). Wartburg College. Methods of Elementary Science. Conceptual Change in Science.

Guest Speaker (2013). Autism and Service Dogs. Retrieving Freedom Fundraiser. May 21. Waverly, Iowa.

Board Member (2012). Autism Society of Iowa. Education Committee.

Board Member (2011). Autism Society of Iowa. Education Committee.

University

Advisory Council Member - Center for Energy and Environmental Education

UNI Strategic Planning Committee (2021-Present)

Search Committee (2021). Professional Development Coordinator. Jacobson Center for Comprehensive Literacy.

Search Committee (2021). Research Coordinator. Jacobson Center for

Comprehensive Literacy.

Elementary Education Division Coordinator (2020-Present)

Elementary Education MAE Program Coordinator (2020-Present)

Elementary Education BA Program (K-6) Coordinator (2020-Present)

Search Committee (2019). Center for Educational Transformation Program Manager.
College of Education.

State Report Committee (2019). Charge for the Committee: Study teacher preparation program and develop proposals on how to respond to the state report, specifically focused on clinical experience (Level 3), content, and diversity.

Search Committee (2019) Des Moines Regional Student Teaching Coordinator. College of Education.

Search Committee (2019) Tenure-Track Faculty. Educational Technology. Curriculum and Instruction. College of Education (successfully hired Dr. Bryans-Bongey).

Chair of Search Committee (2018). Tenure-Track Faculty. Elementary Education Division. Curriculum and Instruction. College of Education (successfully hired Dr. Laura Edwards).

Quality Initiative Proposal Committee Member (2017-2020)

NGSS Advisor (2017-2019). Americorp. Sustainable Schools AmeriCorps program.

Curriculum and Instruction College of Education Scholarship Committee (2017).

Search Committee Member (2017). Tenure-Track Faculty. Elementary Education Division. Curriculum and Instruction. College of Education. (Successfully hired Dr. Irene Walker).

Discussion Leader (2016). Education Summit. Women in Science. University of Northern Iowa. Cedar Falls, Iowa. November 14-15.

Guest Lecturer (2015). University of Northern Iowa. Methods for Teaching Physical Science. Implementing the Science Writing Heuristic.

Elementary Education Division Committee Member.

Student Outcomes Assessment Plan Committee Member.

Graduate Advising

Total Number of Current Graduate Advisees

MAE _____ **Ed.D.** 3

Total Cumulative Number of UNI Graduate Advisees:

MAE 0 **Ed.D.** 3

Ed.D. Advisees

2018-Present- Marine Pepanyan - Committee Member

2019- Finished- Lisa Chizek - Committee Member

2019- Finished- Abby Weiland - Committee Member

Professional Memberships (Current or Former)

Association for Science Teacher Educators (ASTE)

National Science Teachers Association (NSTA)

Iowa Science Teaching Section (ISTS)

National Council of Teachers of Mathematics (NCTM)

American Educational Research Association (AERA)

Partnerships With Schools

2021-Present	Cunningham Elementary School, Waterloo, Iowa. Professional Development School Partnership
2020-Present	Fort Dodge Community School District. (All K-5 schools). Elementary Science Consultant
2016-Present	Irving Elementary School, Waterloo, Iowa Professional Development School Partnership
2018-Present	King-Chavez Preparatory School, San Diego, California. Next Generation Science Standards Consultant.

2018-Present

**King-Chavez Excellence Academy, San Diego,
California. Next Generation Science Standards
Consultant.**

Undergraduate Honors Thesis

Director

2020 - Whitney Canaday

Title - Science Curriculum Alignment to the Next Generation Science Standards.

2016 - Bridget Tharp

***Title:* Does a Growth Mindset Improve Argument-Based Inquiry and Predict Student Outcomes and Standardized Science Assessments?**