

Tammy Dutton Lee

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Education

PhD Candidate, Science Education. North Carolina State University (Graduation May, 2015).

Masters in Education. December 2003. Concentration in Science Education, East Carolina University

Bachelor of Science in Education. May 1994. Elementary Education, East Carolina University

Honors/Awards

Elementary School Distinguished Service Award for Exceptional Service to Science Education in North Carolina November 2004, North Carolina Science Teachers Forum Greensboro, NC.

National Board Certification. November 1999. Early Childhood Generalist

Related Work Experience

Teaching Instructor, Mathematics, Science, and Instructional Technology Education Department, College of Education, East Carolina University (2005 - current).

Responsible for teaching elementary science methods courses that focus on science pedagogical content knowledge for elementary pre-service teachers through the completion of an (9 hour) field experience. Additional responsibilities include recruitment of clinical teachers, securing placements, and monitoring field experiences.

Director of the Elementary Science Concentration, Mathematics, Science, and Instructional Technology Education Department. College of Education, East Carolina University (2011-current).

Leading a team of science educators in the creation, design, implementation, and recruitment of three science content courses (physical, life and earth) and one informal science course for a newly revised elementary science concentration for elementary pre-service teachers.

Lead Teaching Instructor of the Elementary Science Concentration, Mathematics, Science, and Instructional Technology Education Department. College of Education, East Carolina University (2012-current).

Responsible for instruction of elementary science concentration courses; 3270 Physical Science, 3280 Life and Environmental Science, 3290 Earth Systems Science, and 3336 Informal Science and Field Experiences in Elementary School.

Director of The East Carolina University Summer Science Camp, College of Education, East Carolina University (2006- current).

Responsibilities include curriculum design of summer science camp sessions for students in grades 2 – 8, professional development for pre-service teachers to serve as counselors, preparation of high school student volunteers, organizing faculty at East Carolina University to serve as STEM volunteers during camp sessions, organizing registration, maintaining parent

communication before, during and after camp, and overseeing daily operations of the camp before, during and after camp sessions.

Project manager of FoodMASTER Initiative, Department of Nutrition Science, College of Human Ecology and the Department of Mathematics, Science, and Instructional Technology Education, East Carolina University (August 2008-2012).

Responsibilities included recruitment of teachers for implementing FoodMASTER curriculum, creating and building infrastructure for new grant proposals, working with FoodMASTER associates to submit new grant proposals, and publications of new research data.

K-5 Science Facilitator for North Carolina Partnerships for Improving Mathematics and Science (NC PIMS), National Science Foundation Grant, University of Chapel Hill, General Administration, (2003-2005).

Responsibilities included working with science facilitators to write and implement science professional development entitled "Inquiry Based Learning" in 16 eastern NC counties, working with science facilitators and science faculty from multiple universities to design a graduate course in physical science for lead teachers, supervised and trained 21 lead teachers in science professional development and graduate courses, created district leadership teams within two eastern NC counties to establish a model for sustainability and promoting continued development in science and mathematics education in the respective counties.

Second grade teacher, G.R. Whitfield Elementary, Pitt County Schools (1995-2003).

Responsibilities included implementation of the North Carolina Standard Course of Study and National Standards for all subject areas, served as chairperson for the Teachers Assistance Team working with teachers on how to implement strategies for working with students with special needs, served as chairperson for writing School Improvement Plans. Led professional development sessions for obtaining National Board Certification in the area of Inquiry-based Science.

Kindergarten teacher, Belvoir Elementary, Pitt County Schools (1994-1995).

Responsibilities included implementation of the North Carolina Standard Course of Study in all subject areas.

Scholarly Activities

Current Research

Doctoral Research: Major advisor Dr. Gail Jones, NC State University (Defense date March 19, 2015).

Science Teachers' Representational Competence and Systems Thinking.

This dissertation focuses on science teachers' knowledge of systems thinking in the context of the water cycle and the cognitive decisions made by elementary teachers (novice and experienced) about instructional representations for science instruction. The study is framed in the systems thinking skills emphasized by the Next Generation of Science Standards.

Lead Researcher, Elementary Science Concentration, Mathematics, Science, and Instructional Technology Education Department. College of Education, East Carolina University (2012-current).

Created and implemented an evaluation and research plan for the elementary science concentration program. The evaluation plan includes measuring beliefs and attitudes towards science and science teaching. Conceptual development is evaluated through pre and post content assessments within all three content courses (physical, life and earth). Research

includes examining how, when, and why elementary pre-service teachers develop and retain a science teacher identity through their experiences in an elementary science concentration.

Publications

Lee, T., and Lubischer, J. (2014). Close Encounters of the Amphibious Kind: Frog calls across disciplines and ponds. *Science and Children*. 51, 6.

Jones, M. G., Gardner, G., **Lee, T.**, Poland, K., & Robert, S. (2013). The impact of microbiology instruction on students' perceptions of the risks of microbial illness. *International Journal of Science Education, Part B: Communication and Public Engagement*, 3, 3, 199-213.

Price, S., Bosse, M., & **Lee, T. D.** (2011). Redefining curriculum integration and professional development: inservice teachers as change agents. *Current Issues in Education*, 14, 3.

Bossé, M. J., **Lee, T. D.**, Swinson, M., & Faulconer, J. (2010). The NCTM Process Standards and the Five Es of Science: Connecting Math and Science. *School Science and Mathematics*, 110, 5, 262-276.

Duffrin, M.W., Hovland, J., Carraway-Stage, V., McLeod, S., Duffrin, C., Phillips, S., Rivera, D., Saum, D., Johanson, G., Graham, A., **Lee, T.**, Bosse, M., & Berryman, D. (2010). Using Food as a Tool to Teach Science to 3rd Grade Students in Appalachian Ohio. *Journal of Food Science Education*, 9, 2, 41-46.

James, L. E., Laatsch, S., Bosse, M., Rider, R. J., & **Lee, T. D.** (2006). Science Center Partnership: Outreach to Students and Teachers. *Rural Educator*.

Publications in Review

Lee, T., & Jones, M.G. (2015). Instructional Representations as Tools to Teach Systems Thinking. *Models and Modeling in Science Education*. Accepted chapter, submitted for peer review.

Funded Grant Work

Physics IS Essential- Mathematics Science Partnership Grant Department of Education
Total Award \$550,000. (2011-2014) PI Mark Sprague Co-PI Tammy D. Lee
Provided 84 hours of professional development in physical science and pedagogical approaches to teaching physical science in middle and elementary school classrooms. Responsibilities included creating and designing professional development sessions in physical science for teachers (6-8), year 1, (3-5), year 2, & (K-2), year 3. Led the pedagogical content portion of the professional development of the grant focusing on developing physical science instructional units which focused on the new essential science standards of North Carolina and the Next Generation of Science Standards. Created and implemented a model of professional development involving a summer enrichment environment in which teachers taught designed units to students within the camp using intensive reflective debriefing sessions of their teaching.

Impacting STEM Career Intentions of Middle School Youth Utilizing Multidisciplinary Food Technology Approach and Scientific Inquiry National Science Foundation ITEST
Total Award \$1, 440, 428 (2011-2014)
Responsibilities included reviewing camp curriculum materials, training counselors (non-education majors) in inquiry-based approaches and classroom management strategies for working with middle school students within an investigative informal science environment.

FoodMASTER (phase 2): Impacting K-12 Learning Environments- National Institute of Health

Total Award \$500,000 (2008-2011)

Using innovative multi-media and hands-on, inquiry-based experiences to promote understanding of basic sciences and encourage science careers.

Responsibilities included recruitment of teachers, training teachers in curriculum and assisting with research of curriculum on dietary behaviors and attitudes toward math and science.

Scholarly Presentations

Lee, T. (2015). An Exploration of Systems Thinking among Elementary Pre-Service Teachers: Selection and Use of Multiple Pictorial Representations for a Proposed Lesson on the Water Cycle. Poster presentation at The Association for Science Teacher Education meeting. Portland, Oregon.

Kier, M., **Lee, T.**, & Garner, M. (2015). Transforming Science Teaching Identities: Lessons Learned from Pre-Service Teachers in a Science Concentration. Paper presented at The Association for Science Teacher Education meeting. Portland, Oregon.

Glass, B., **Lee, T.**, & Garner, M. (2015). Creating Science Identity with Pre-Service Teachers within an Informal Science Education Course. Syllabus Share at The Association for Science Teacher Education meeting. Portland, Oregon.

Lee, T., Kier, M., & Garner, M. (2014). Building positive “possible selves” in elementary science: Examining the effects of an elementary science concentration on pre-service teacher’s confidence to teach science. Paper presented at The Association for Science Teacher Education meeting. San Antonio, TX.

Lee, T., Glass, B., & Garner, M. (2014). Creating and revising an elementary science concentration: Moving towards The Next Generation of Science. Syllabus Share at The Association for Science Teacher Education meeting. San Antonio, TX.

Lee, T. (2013). The Exploration of Elementary Pre-service Teachers Science Epistemic Beliefs and Science Content Knowledge on the Selection, Rationale, and Use of Visual Representations. Poster presentation at the STEM Education Research Symposium. Raleigh, NC.

Lee, T., & Sprague, M. (2012). Model of professional development for Physics IS Essential Mathematics and Science Partnership Grant. Poster presentation at the Bridging the GAP and STEM Education. Raleigh, NC.

Jones, M.G., Gardner, G., & **Lee, T.** (2012, March). Microbiology instruction: Students’ perceptions of risks related to microbial illness. Paper presented at the National Research of Science Teaching meeting. Indianapolis, IN.

Jones, M.G., Gardner, G., & **Lee, T.** (2012). Microbiology instruction: Students’ perceptions of risks related to microbial illness. Poster presentation at STEM Education Research Symposium. Raleigh, NC.

Price, S., & **Lee, T.** (2010). Investigation of the development of Nature of Science on Elementary Pre-service Teachers. Paper presented at the National Research of Science Teaching meeting. Philadelphia, PA.

Professional Development Presentations

Lee, T., Garner, M., & Glass, B. (2015). Promoting Success for ALL Learners in STEM! National Science Teachers Association. Chicago, IL.

Lee, T., Glass, B., & Garner, M. (2014). Teaching with Pictures. North Carolina Science Teachers Association. Winston Salem, NC.

Lee, T., & Garner, M. (2013). Getting Your Students on the Right Track for STEM. National Science Teachers Association. Charlotte, NC.

Lee, T., & Sprague, M. (2012). Physics IS Essential for Engaging Minds in Science. Bridging the GAP (STEM). Raleigh, NC.

Lee, T., & Sprague, M. (2012). Physics IS Essential-Mathematics and Science Partnership Grant. North Carolina Science Teachers Association. Winston Salem, NC.

Lee, T., & Garner, M. (2012). Simple as Water (Inquiry lessons in K-5 classrooms). North Carolina Science Teachers Association. Winston Salem, NC.

Schleigh, S., & **Lee, T., (2012).** Classrooms Reaching Enquiry through Research & Telescope Education (CREATE). National Science Teachers Association. Indianapolis, IN.

Lee, T., & Garner, M. (2011). Fizz, Bang, Boom! Teaching chemistry in an informal science summer camp. North Carolina Science Teachers Association. Greensboro, NC.

Lee, T., Carraway, V., & Duffrin, M. (2010). FoodMASTER Conference-Presentation of FoodMASTER curriculum and research being conducted in North Carolina and Ohio. National Science Teachers Association, New Orleans, LA.

Lee, T., Carraway, V., & Duffrin, M. (2009). FoodMASTER Conference-Presentation of FoodMASTER curriculum and research being conducted in North Carolina and Ohio. North Carolina Science Teachers Association. Greensboro, NC.

Schleigh, S., **Lee, T., & Meredith, J. (2009).** Poster presentation at Astronomical Society of the Pacific conference regarding teacher professional development. San Francisco, CA.

Schleigh, S., **Lee, T., & Meredith, J. (2009).** Telescope Making Workshop Presented at the North Carolina Science Teachers Professional Development Institute. Greensboro, NC.

Lee, T. (2007-2009). East Carolina University Share-A-Thon Pre-service teachers presentations of inquiry 5E lessons completed during practicum experiences. North Carolina Science Teachers Association. Greensboro, NC.

Lee, T. (2005-2009). Study Grants, Organized teachers presentation of study grant awardees for the North Carolina Science Teachers Association. Greensboro, NC.

Lee, T., & James, L. (2004-2006). Cosmic Explorations Lesson Study NASA grant working with Craven County teachers on implementing Lesson Study as professional development focusing on Moon, Sun and Stars content. North Carolina Science Teachers Association. Greensboro, NC.

Lee, T. (2003). National Board Certification Tips for making your science instruction inquiry-based for National Board Certification. Greenville, NC.

Lee, T. (2003). International Connections Group Presentation with the North Carolina Museum of Natural Sciences on the developing connections with teachers in Belize with North Carolina teachers. North Carolina Science Teachers Association. Greensboro, NC.

Service

College and Department Service

Executive Advisory Board (2014) Fixed Term Faculty representative. Mathematics, Science, and Instructional Technology Education Department.

Science Education Club (2007-current) Faculty advisor. Mathematics, Science, and Instructional Technology Education Department.

Curriculum Committee (2013-2014) Representative for the Science Education Program Area. Mathematics, Science, and Instructional Technology Education Department.

Chair of the Search Committee (2013) Fixed Term Elementary Science Teaching Instructor. Mathematics, Science, and Instructional Technology Education Department.

Member of the Search Committee (2013) Assistant Director for the STEM Center. Mathematics, Science, and Instructional Technology Education Department.

Council of Teacher Education (2007-2009) Representative for the Science Education Program Area. College of Education. East Carolina University.

Curriculum Committee (2007-2008) College of Education. East Carolina University.

Evaluation and Planning Committee (2008-2009) Chairperson responsible for directing and organizing Ad Hoc committees on developing evidences for Department of Public Instruction accreditation. College of Education. East Carolina University.

Policy Committee (2008-2009) College of Education. East Carolina University.

Professional Memberships

North Carolina Science Teachers Association (1999-current)

National Science Teachers Association (1999-current)

North Carolina Science Leadership Association (1999-current)

National Research of Science Teaching (2009- current)

Association of Science Teacher Education (2012-current)

Phi Delta Kappa International (2008-current)

Professional Service

Presidential Selection Committee (2010-2014)
Selected by the NC Department of Education to serve as a reviewer for selecting the Presidential Award winner for Excellence in Mathematics and Science Teaching.

The Association for Science Teacher Education (2013-2014)

Reviewed proposals for strand(s) elementary pre-service teachers, STEM education, and Informal Science.

National Research of Science Teaching (2013)

Reviewed proposals for strand(s) 3, 6, & 7 for NARST Annual Conference

North Carolina Science Teachers Association (2009-2012)

Elected as District 1 Director for eastern North Carolina for two terms. Served as chairperson for the Study Grants Committee awarding teachers grant monies for special projects (2005-2008). Assisted in the organization of the North Carolina Teachers Association Conference (2004-2007) and Regional National Science Teachers Conference (2008 Charlotte) Organized Drive In conferences for our district.

National Science Teachers Association (2009-2012)

NSTA Standing Committee, Panel and Advisory Board: Committee on Pre service Teacher Preparation (3 year appointment).

Mini-Symposium for Learning Mathematics and Science (2012)

Invited to present ideas on models of professional development established through Mathematics Science Partnership grants. Panelist included Dr. Gail Jones Science, Technology, Engineering and Math Education (STEM) Professor NC State University, Dr. Halberda, PhD Associate Professor The Department of Psychological and Brain Science The Johns Hopkins University, Jeffrey E. Barrett Professor of Mathematics Education in the Department of Mathematics and Associate Director of the Center for Mathematics, Science and Technology (CeMaST) Illinois State University.

Development Team of the New Essential Science Standards Elementary (2009)

Invited to serve as reviewer and advisor for the development of the North Carolina New Essential Science Standards for Elementary Grades.

Reviewer of Curriculum Units (August 2007-July 2008)

Selected as a reviewer for North Carolina Department of Public Instruction of K-5 Science Curriculum Units.

Designer of Professional Development Modules (2007)

Created and implemented professional development modules for fourth and fifth grade teachers across the state of North Carolina focusing on physical, earth, and life sciences. North Carolina Department of Public Instruction.

Community Service

Science Olympiad (2012-current)

Leading elementary science concentration pre-service teachers in the development of the Experimental Design Event for all North Carolina Science Olympiad events across the state of North Carolina.

Family Science Night (2013-current)

Leading elementary science concentration pre-service teachers in the design, planning, and implementation of Family Science Nights at local elementary schools.

Family Science Kits (2013-current)

Leading elementary science concentration pre-service teachers in the design and implementation of Family Science Kits to at-risk families in local schools. Science kits provide families the opportunity to explore science concepts taught in elementary school science.

Science Fair Consultant and Organizer (2007-current)

Assisting elementary schools in a local school district in organizing science fairs, consulting with teachers on implementing methods into classroom instruction to assist students with developing science research projects and organizing pre-service teachers to serve as judges for local schools.

National Board Certification (2003-2005)

Implemented a mentoring program for teachers pursuing National Board Certification, focusing on Inquiry Science, for three local districts in eastern NC.

Parents Utilizing Standards at Home” (PUSH) (2003-2005) Implemented parent workshops with emphasis on educating parents about math standards and their impact on math instruction in elementary schools.