

Melissa L. Shirley

CEHD Teaching & Learning
University of Louisville
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EDUCATION

Ph.D., Science Education, The Ohio State University, Columbus OH, 2009

- ◆ Dissertation: A Model of Formative Assessment Practice in Secondary Science Classrooms Using an Audience Response System
- ◆ Cognate Area: Quantitative Analysis

M.S., Education and Allied Professions (Educational Leadership), University of Dayton, Dayton OH, 2005

M.S., Developmental Neurobiology, Case Western Reserve University, Cleveland OH, 1997

Post-Baccalaureate Initial Teacher Certification Program, Ashland University, Ashland OH, 1997

B.S., Biological Sciences, Carnegie Mellon University, Pittsburgh PA, 1993

- ◆ Concentration in Biochemistry

CURRENT APPOINTMENT

July 2009-present

University of Louisville

- ◆ Assistant Professor, Science Education; College of Education and Human Development; Department of Teaching and Learning
- ◆ Courses Taught:
 - EDTP 506 (Public Schools in America; Fall 2009, Fall 2010)
 - EDTP 407/607/608/609 (Methods of Teaching Middle/Secondary Science; Fall 2009, Fall 2010)
 - EDTP 355 (Assessment and Research; Spring 2010)
 - EDAP 637 (Using Assessment to Improve Student Achievement; Spring 2010, Spring 2011)
 - EDAP 676-31 (Technology Applications for Science Teachers; Summer 2010)
 - EDAP 477/677 (Student Teaching Capstone; Spring 2011)
- ◆ Student Advising:
 - Program Committee Member for Stephanie Phillip, doctoral student.
 - Dissertation Committee Member for Cherry Boyle, doctoral student.
 - Advisor for MAT program for students: James Huffman, Julie Age, Alicia Pahl, Brent Fiascetti, Tua McDermott, Natalie Hubbard, Michael Drake, Kristin McCall, Rebekah Pickerell, Michele Quinones, Barry Reed, Elissa Robb. David Roth, Allison Moehlman, Lauren Niemann, Ronald Simmons Jr., Beth Darrall, Jeremy Winkie
 - Advisor for BS program for students: Audrey Vittitow.
- ◆ Committees Served On: CEPC, MISE program group, CEHD Student Grievances Committee, CEHD Curriculum Committee, I2A Revisions ad hoc committee.

PREVIOUS TEACHING EXPERIENCE

Academic Years 2007-08, 2008-09

The Ohio State University

- ◆ University supervisor for M.Ed. students engaged in field experiences and student teaching; worked with interns during middle school and high school placements in urban, rural, and suburban environments
- ◆ Conducted periodic classroom observations of student interns, led conferences between interns and mentor teachers, gave feedback on lesson planning, led weekly reflective seminars, and assessed interns' weekly assignments. Contacts: Dr. Patricia Brosnan, Gail Hoskins
- ◆ Provided support to weekly program-wide seminars, including giving prepared talks on specific topics.

Winter 2009

The Ohio State University

- ◆ Assistant Instructor for Ed T&L 636.02: Advanced Methods in Teaching Secondary School Science.
- ◆ Planned and implemented specific lessons on animal use and dissection, assessment. Engaged in planning and instructional support throughout the course. Monitored and provided feedback during small group discussions and work sessions. Contact: Dr. Karen Irving

Summer 2007, Summer 2008

The Ohio State University

- ◆ Graduate Teaching Assistant for ED T&L 721.03: Learning and Cognition in Science, Math, and Technology Education.
- ◆ Developed and maintained online course system, graded major projects, and facilitated class discussions of academic journal articles. Contact: Dr. Doug Owens

March 1998-June 2006

Olentangy Local School District

- ◆ Science teacher, grades 9-12. Courses taught include Physical Science, Honors Physical Science, Environmental Science, Biology, Advanced Placement Biology, and Chemistry.

March 2004-September 2004

Columbus State Community College

- ◆ Adjunct faculty member in the Department of Biological and Physical Sciences, Spring & Summer 2004
- ◆ Taught lecture and laboratory components and assisted students in developing long-term independent projects for Bio 174, a general biology course for science majors.

September 1996-December 1996

Case Western Reserve University

- ◆ Graduate Teaching Assistant for sophomore-level Molecular Biology course. Graded weekly problem sets, prepared review lectures for recitation sections, and conducted test review sessions.

PREVIOUS RESEARCH EXPERIENCES

September 2007-June 2009

The Ohio State University

- ◆ Graduate Research Assistant for the Classroom Connectivity in Promoting Mathematics and Science Achievement project (funded through US Department of Education, IES)
- ◆ Performed data analysis, collected project data from students and teachers, conducted participant interviews and observations, and prepared IRB amendments and annual IRB reviews.
- ◆ Worked with the research team to develop annual professional development sessions and conducted workshop sessions with teacher participants.
- ◆ Douglas T. Owens, Ed. D, P.I.; Karen E. Irving, Ph.D., Co-P.I., Stephen J. Pape, Ph.D. (University of Florida), Co-P.I.

January 1993-May 1997

Case Western Reserve University

- ◆ Conducted independent laboratory research in a variety of areas during several laboratory rotations (including fruit fly genetics, molecular biology work, and embryological studies) and full-time thesis work in developmental cell biology. Alison K. Hall, Ph.D., thesis advisor

June 1994-August 1994

Wood's Hole Marine Biology Laboratory

- ◆ Embryology: Cell Differentiation and Gene Expression in Early Development. Six-week intensive study through both lectures and laboratory studies of the development and embryogenesis of experimental organisms. One of 24 graduate students, physicians and post-doctoral researchers worldwide participating in this highly selective annual course.

August 1992-December 1992

National Institutes of Health

- ◆ Participated in highly selective internship to conduct biomedical research in medical genetics. Worked on a project aimed at the identification, cloning, and sequencing of the gene for Huntington's Disease on human chromosome 4. R. Daniel Camerini-Otero, Ph.D., Principal Investigator

June 1992-August 1992

Carnegie Mellon University

- ◆ NSF-sponsored summer undergraduate research program. William E. Brown, Ph.D., research advisor

PROFESSIONAL QUALIFICATIONS AND CERTIFICATIONS

State of Ohio 5-year Adolescence/Young Adult (grades 7-12) Teaching License in Biological Sciences, Chemistry, and General Science (Expiration July, 2014)

Collaborative IRB Training Initiative (CITI) Certificate of Protection of Human Research Subjects, Social and Behavioral Basic Course (Expiration June, 2012)

Proficient with software packages: SPSS, nVivo, Microsoft Office Suite 2007, WinSteps, TQAS, HLM6

PUBLICATIONS AND MANUSCRIPTS

Shirley, M.L., Irving, K.E., Sanalan, V.A., Pape, S.J., & Owens, D.T. (2011). The practicality of implementing connected classroom technology in mathematics and science classrooms. *International Journal of Science and Mathematics Education*, 9(2), 459-481.

Pape, S. J., Irving, K. E., Bell, C. V., **Shirley, M., L.**, Owens, D. T., Owens, S., Bostic, J. D., & Lee, S. C. (in press). Principles of effective pedagogy within the context of connected classroom technology: Implications for teacher knowledge. In R. N. Ronau, C. R. Rakes, & M. L. Niess (Eds), *Educational technology, teacher knowledge, and classroom impact: A research handbook on frameworks and approaches*. Hershey, PA: IGI Global.

Irving, K. E., Sanalan, V.A., & **Shirley, M.L.** (2009). Physical science connected classrooms: Case studies. *Journal of Computers in Mathematics and Science Teaching*, 28(3), 247-275.

Shirley, M.L., Campbell, J.D., & Hall, A.K. (1996) "Development of neuron-specific tubulin precedes catecholamine synthesis in sympathetic neuronal precursors *in vivo*" *J. Neurosci. Res.* 46, 42-48.

PAPER AND POSTER PRESENTATIONS (National/International)

Pape, S.J., Irving, K.E., Owens, S., **Shirley, M.L.**, Bell, C.V., Bostic, J.D., Lee, S.C., & Owens, D.T. (2011, April). Mechanisms for effective implementation of classroom connectivity technology in algebra I classrooms. A presentation at the American Educational Research Association annual conference, New Orleans, LA.

Philipp, S.B. & **Shirley, M.L.** (2011, March). Understanding aspects of pre-service teacher questioning skills. A presentation at the National Association of Research in Science Teaching annual conference, Orlando, FL.

Shirley, M.L. & Philipp, S.B. (2011, March). Qualities of pre-service teachers' classroom questioning. A presentation at the National Association of Research in Science Teaching annual conference, Orlando, FL.

Lee, S.C., Irving, K.E., Owens, D.T., Pape, S.J., & **Shirley, M.L.** (2011, March). Modeling of student perceptions of learning in connected science classrooms: How to facilitate learner-centered environments. A presentation at the National Association of Research in Science Teaching annual conference, Orlando, FL.

Philipp, S.B. & **Shirley, M.L.** (2011, January). Pre-service teachers' self-analysis of questioning practices. A poster presented at the Association of Science Teacher Educators annual conference, Minneapolis MN.

Shirley, M.L. & Philipp, S.B. (2011, January). A characterization of middle and secondary pre-service teachers' questioning skills. A presentation at the Association of Science Teacher Educators annual conference, Minneapolis MN.

Shirley, M.L. & Peters, S.A. (2011, January). Development and implementation of a revised technology course for middle/secondary science teachers. A presentation at the Association of Science Teacher Educators annual conference, Minneapolis MN.

Shirley, M.L. & Irving, K.E. (2010, March 24). A characterization of rich formative assessment practice in secondary science classrooms equipped with an audience response system. A paper presented at the National Association for Research in Science Teaching annual conference, Philadelphia, PA.

Shirley, M.L. & Irving, K.E. (2010, Jan.15). A descriptive model of formative assessment in secondary science classrooms using an audience response system. A presentation at the Association of Science Teacher Educators annual conference, Sacramento, CA.

Shirley, M. L., Irving, K.E., Owens, D.T., Pape, S.J. & Abrahamson, L. (2009, June). Formative assessment cycles in secondary science classrooms using interactive networked classroom technology. A poster presented at the Fourth Annual Research Conference of the Institute of Education Sciences, Washington, DC.

Irving, K.E., Sanalan, V.A., Pape, S.J., Owens, D.T., Abrahamson, L. & **Shirley, M.L.** (2009, June). Classroom connectivity in promoting mathematics and science achievement: Year 3 implementation fidelity. A poster presented at the Fourth Annual Research Conference of the Institute of Education Sciences, Washington, DC.

Shirley, M.L., Irving, K.E., Sanalan, V.A., Pape, S.J., & Owens, D.T. (2009, Jan.). Implementation of connected classroom technology in mathematics and science classrooms. A paper presented at the Association of Science Teacher Educators annual conference, Hartford, CT.

Irving, K.E., Sanalan, V.A., **Shirley, M.L.**, Pape, S.J., & Owens, D.T. (2009, Jan.). Implementation fidelity: Connected mathematics and science classrooms. A paper presented at the Association of Science Teacher Educators annual conference, Hartford, CT.

Irving, K.E., Sanalan, V.A., Pape, S.J., Owens, D.T., Abrahamson, L. & **Shirley, M.L.** (2008, June). Classroom connectivity in promoting mathematics and science achievement: Implementation fidelity years 1 & 2. A poster presented at the Third Annual Research Conference of the Institute of Education Sciences, Washington, DC.

Irving, K. E., Sanalan, V.A., & **Shirley, M.L.** (2008, April). The connected classroom: Physical science case studies. A paper presented at the National Association for Research in Science Teaching annual conference, Baltimore, MD.

Nehm, R., **Shirley, M.**, Carasco, A., & Driscoll, M. (2008, April). Development, implementation, and evaluation of a new assessment instrument for measuring student knowledge of genetics and natural selection. A paper presented at the National Association for Research in Science Teaching annual conference, Baltimore, MD.

Irving, K. E., Sanalan, V.A., & **Shirley, M.L.** (2008, Jan.). Technology-facilitated formative assessment in physical science connected classrooms: Case studies. A paper presented at the Association of Science Teacher Educators annual conference, St. Louis, MO.

Shirley, M.L., Irving, K.E., & Sanalan, V.A. (2008, Jan.). Teaching and assessing science through connected classroom technology. A workshop presented at the Association of Science Teacher Educators annual conference, St. Louis, MO.

Irving, K.E., Sanalan, V., Abrahamson, L., Ucar, S., **Shirley, M.**, & Pape, S.J. (2007, June). Classroom connectivity in promoting achievement in algebra and physical science: Implementation fidelity. A poster presented at the Second Annual Research Conference of the Institute of Education Sciences, Washington, DC.

Shirley, M.L. & Irving, K.E. (2007, March 10). Using TI-Navigator™ to explore science graphs. A workshop presentation at the annual Teachers Teaching with Technology (T³) International Conference sponsored by Texas Instruments, Inc., Chicago, IL.

PAPER AND POSTER PRESENTATIONS (Regional/State)

Shirley, M.L. (2011, May 23-25). Using Word Clouds to Enhance Teaching and Learning. A poster presented at the 2011 Kentucky Converging Trends Conference, Erlanger, KY. *Proposal accepted.*

Shirley, M.L., Thomas, M.S., & Schack, G.D. (2011, May 23-25). I-Searching for Meaning: Convergence of Critical Thinking, Technology, and Relevance. A presentation at the 2011 Kentucky Converging Trends Conference, Erlanger, KY. *Proposal accepted.*

Philipp, S.B. & **Shirley, M.L.** (2010, September 24). Development of pre-service teachers' questioning practice through self-analysis. A presentation at the Mid-Atlantic Association of Science Teacher Educators regional conference, Johnson City, TN.

Shirley, M.L. & Philipp, S.B. (2010, September 24). Characteristics of pre-service middle and secondary science teachers' whole-class questioning patterns. A presentation at the Mid-Atlantic Association of Science Teacher Educators regional conference, Johnson City, TN.

Lee, S.C., Irving, K.E., Owens, D.T., Pape, S.J., & **Shirley, M.L.** (2010, September 25). Relationships among student perceptions of learning and student metacognition and teacher awareness in connected science classrooms. A presentation at the Mid-Atlantic Association of Science Teacher Educators regional conference, Johnson City, TN.

Shirley, M.L. (2010, May 27) Knowing what students know: Identifying and implementing high-quality formative assessment. A presentation at the 10th Annual Kentucky Conference on the Scholarship of Teaching and Learning, Lexington KY, May 26-27.

Shirley, M.L. & Irving, K.E. (2009, Sept.25). Components of formative assessment cycles in secondary science classrooms using an audience response system. A presentation at the Mid-Atlantic Association of Science Teacher Educators regional conference, Portsmouth, OH.

Shirley, M.L., Irving, K.E., Sanalan, V.A., Pape, S.J., & Owens, D.T. (2008, Oct. 16). Implementation of connected classroom technology: Comparison of mathematics and science classrooms. A presentation at the Northeast Association of Science Teacher Educators regional conference, East Stroudsburg, PA.

Shirley, M.L., Irving, K.E., Sanalan, V.A., Pape, S.J., & Owens, D.T. (2008, Sept. 12). The practicality of connected classroom technology: Comparison of mathematics and science classrooms. A presentation at the Mid-Atlantic Association of Science Teacher Educators regional conference, Lake Lure, NC.

Sanalan, V. A., Irving, K. E., Pape, S. J., Owens, D. T., Abrahamson, L., Boscardin, C. K., Ucar, S., Kaya, S., & **Shirley, M.L.** (2007, Sept). A professional development program for science teachers: Classroom connectivity. A paper presented at the Mid Atlantic Association of Science Teacher Educators (ASTE) meeting, Ansted, WV.

Irving, K. E., Sanalan, V. A. & **Shirley, M.L.** (2007, Sept). Connected classroom technology in physical science classrooms: Preliminary findings. A paper presented at the Mid Atlantic Association of Science Teacher Educators (ASTE) meeting, Ansted, WV.

Shirley, M.L., Irving, K.E., Sanalan, V., Boscardin, C.K., & Ucar, S. (2006, Oct. 7). A comparison of two approaches to statistical analysis of a physical science pilot assessment. A paper presented at the Mid-Atlantic Association of Science Teacher Education annual conference, Marion VA.

PROFESSIONAL MEMBERSHIPS

American Education Research Association (AERA; 2010)
Association for Supervision and Curriculum Development (ASCD; 2004- 2009)
National Science Teachers Association (NSTA; 2006-current)
Association for Science Teacher Education (ASTE; 2006-current)
National Association for Research in Science Teaching (NARST; 2006-current)

INVITED TALKS

Using concept mapping tools (2010, October 16). An invited presentation for the Louisville Writing Project. Contact person: Jean Wolph, Director of the Louisville Writing Project.

Implementing Effective Formative Assessment. (2010, September 22). An invited talk to a class of 8 Kentucky Teacher Internship Program interns enrolled in a seminar course at the University of Louisville. Contact person: Peggy Brooks, KTIP Regional Coordinator.

Using Concept Mapping Tools in Science Teacher Education. (2010, August 20). An invited talk at the Technology Fair sponsored by the University of Louisville College of Education and Human Development Technology Committee., Louisville, KY.

Formative Assessment in Connected Classrooms. (2009, October 30). An invited talk to the Assessment for Learning research group at Western Michigan University, Kalamazoo, MI.

Cover Letters and Highly Qualified Teacher Status (2009, Jan. 30). An invited talk for a cohort of 40 pre-service teachers enrolled in a combined Master of Education and secondary math or science licensure program at The Ohio State University. Contact person: Gail Hoskins, Program Manager.

Using TI-Navigator™ to Assess Student Understanding (2008, Dec. 3). An invited presentation to a group of Indonesian education research scholars visiting The Ohio State University. Contacts: Dr. Doug Owens, Dr. Karen Irving.

Crisis Planning and Prevention: Dealing with Emergencies in Schools (2008, Oct. 24). An invited talk for a cohort of 40 pre-service teachers enrolled in a combined Master of Education and secondary math or science licensure program at The Ohio State University. Contact person: Gail Hoskins, Program Manager.

Using TI-Navigator™ to Explore Linear Equations (2008, Oct. 3). An invited presentation to the faculty and staff of the College of Education and Human Ecology, The Ohio State University. Contacts: Dr. Doug Owens, Dr. Karen Irving.

Introduction to Innovative Technology Use (2008, April 29). An invited presentation for an integrated math and science graduate course offered through The Ohio State University, Mansfield Campus. Contact person: Dr. Donna Farland-Smith, course instructor.

A Perspective on Interviewing (2008, March 7). An invited talk for a cohort of 40 pre-service teachers enrolled in a combined Master of Education and secondary math or science licensure program at The Ohio State University. Contact person: Gail Hoskins, Program Manager.

GRANTS AND GRANT PROPOSALS

Shirley, M.L. “Formative assessment strategies of science teachers (FASST)”. (2011, January). Proposal submitted to NSF DRK-12 award competition, Challenge 3. Letter of Intent # L02272689 submitted November 4, 2010. Full proposal # 1118647 submitted January 5, 2011. Amount requested: \$327,969. *Under review.*

Shirley, M.L. “Induction Year Teachers’ Use of Formative Assessment Strategies”. (2010, October). Proposal submitted to Nystrand/Offutt Scholar Competition for course buyout in Spring 2011, Summer 2011 salary support, \$1000 in conference travel support, and \$500 for supplies. Unfunded.

Shirley, M.L. “Supporting gifted students through academic competition”. (2005, May). Grant-to-Educators award funded by the Martha Holden Jennings Foundation to purchase training materials and pay tournament registration fees for a high school academic quiz bowl team. Amount Funded: \$1800.

Shirley, M.L. “Scientific investigation in the palms of our hands”. (2001, June). Grant proposal funded by the Olentangy Pride Foundation to purchase Palm Pilots™ and ImagiProbe™ sensors. Amount Funded: \$5900.

AWARDS AND HONORS

University Fellowship recipient for first year of graduate study at The Ohio State University (2006-2007)
Member of Pi Lambda Theta (National education honor society; 2007-present)
Member of Phi Kappa Phi (National academic honor society; 2007-present)
Selected for inclusion in Who's Who Among American Teachers (2004, 2005, 2006)
Nominated for Disney Teacher of the Year award (2005)
Carnegie Tradition Award (1989), merit-based scholarship award
Yale Book Award (1988)

SERVICE AND PROFESSIONAL DEVELOPMENT

- ◆ Member of the Membership Committee for the Association for Science Teacher Education (2011)
- ◆ Co-Chair, 2011 Mid-Atlantic Association for Science Teacher Education annual regional conference (2011)
- ◆ Teacher Educator committee member for Kentucky Teacher Induction Program (2010-2011)
- ◆ Representative from University of Louisville to APLU-SMTI Conference (June 2010)
- ◆ Science Fair judge (DuPont Manual Science Fair; March 2010, March 2011)
- ◆ Teacher Educator committee member for Kentucky Teacher Induction Program (2009-2010)
- ◆ Planning Team member for Mid-Atlantic Association for Science Teacher Education (MA-ASTE) regional conference (2009)
- ◆ Attended "Classroom Assessment for Student Learning" Conference (September 2009)
- ◆ Graduate Student Representative to the Publications Committee of ASTE (2009)
- ◆ Reviewer, School Science and Mathematics Journal (2008, 2009)
- ◆ Graduate Student Representative to the Regional Units Committee of ASTE (2008)
- ◆ Proposal reviewer for annual ASTE national conference (2007, 2008)
- ◆ Proposal reviewer for annual NARST national conference (2006, 2007, 2008, 2009, 2010)
- ◆ Treasurer, "Ohio State University Mathematics, Science, and Technology Educators and Researchers" (OSU-MSaTERs) graduate student organization (Fall 2007 – Spring 2009)
- ◆ Science fair judge, 57th Ohio State Science Day (Spring, 2005)