VICKIE M. WILLIAMSON

CURRICULUM VITA

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PERSONAL DATA

Address: 6800 Bendwood
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EDUCATION

Ph. D. in Science Education (Chemical Education); University of Oklahoma; Norman, OK: May 1992.
Research Advisor: Dr. Michael R. Abraham, Department of Chemistry & Biochemistry.
Dissertation: *The effects of computer animation emphasizing the particulate nature of matter on the understandings and misconceptions of college chemistry students.*

M.S. in Chemistry (Chemical Education); University of Oklahoma; Norman, OK: May 1977.

B.S. in Natural Science (Chemistry Emphasis); University of Central Oklahoma (formerly Central State University); Edmond, OK: July 1974.

PROFESSIONAL EXPERIENCE

https://orcid.org/0000-0002-6071-8765 ResearcherID: C-3351-2015

Instructional Professor. Department of Chemistry, Texas A & M University, College Station, TX. (Lecturer, September 1997 to August 1999; Senior Lecturer, September 1999-August 2011; Instructional Assistant Professor, September 2011-August 2016; Instructional Associate Professor, September 2016-August 2017; Instructional Professor, September 2017 to present.) Instructor for large lecture, general chemistry courses and coordinator of on-line homework. Dr. Emile Schweikert, Head 1997-2006. Dr. David Russell, Head 2006-2014, Dr. Francois Gabbi, Head 2014-2016 Dr. Simon North, head, 2016-present.

Curriculum Specialist. Center for Mathematics, Science, and Technology, Illinois State University, Normal, Illinois. June 14, 1993 to July 1997. Developed integrated middle school science curriculum. Drs. Franzie Loepp and Robert Fisher, Directors.

Lecturer. Department of Chemistry, Illinois State University, Normal, Illinois. January 1994 to July 1997. Instructor for large-lecture fundamentals of chemistry course. Dr. Michael Kurz, Chair.

Visiting Assistant Professor. Department of Chemistry, University of Central Oklahoma (formerly Central State University), Edmond, Oklahoma. January 1993 to May 1993. Full-time temporary faculty teaching chemistry for non-majors and general chemistry II lecture and laboratory. Dr. Fred A. Grosz, Chair.

Adjunct Assistant Professor. Department of Instructional Leadership and Academic Curriculum, University of Oklahoma, Norman, Oklahoma. January 1993 to May 1993. Instructor of secondary science methods course. Dr. Edmund A. Marek, Director of Science Education.

Visiting Assistant Professor. Department of Chemistry and Biochemistry, University of Oklahoma, Norman, Oklahoma. August 1992 to January 1993. Developing elementary physical science curriculum. Writing of NSF and Eisenhower grant proposals for elementary physical science project and teacher workshops. Dr. Bing Fung, P.I.

Adjunct Assistant Professor. Department of Chemistry, University of Central Oklahoma (formerly Central State University), Edmond, Oklahoma. August 1992 to December 1992. Instructor for introductory and second semester general chemistry laboratories. Dr. Fred A. Grosz, Chairman.

Visiting Assistant Professor. Department of Chemistry and Biochemistry, University of Oklahoma, Norman, Oklahoma. June 1992 to August 1992. Lecturer for second semester general chemistry for science and engineering majors for Summer 1992. Dr. Stanley C. Neely, Assistant Chair.

Instructor of the Science Education Academy. Summer Youth Academy, University of Oklahoma, Norman, Oklahoma. July 1992. Development and teaching of a pre-collegiate program in accelerated science for honors students. Dr. Edmund A. Marek, Co-Director.

Graduate Teaching and Administrative Assistant. Department of Chemistry and Biochemistry, University of Oklahoma, Norman, Oklahoma. September 1988 to May 1992. Duties included supervision and weekly training of teaching assistants in general chemistry courses (non-majors course through the science majors sequence), developing curriculum materials, computer grading of large lecture classes, revision of laboratory manuals, teaching laboratory sections, etc. Dr. Michael R. Abraham, Director.

University Supervisor for Student Teachers. College of Education, University of Oklahoma, Norman, Oklahoma. August 1991 to January 1992. Instruction and supervision of public school science student teachers. Dr. Frank Mcquarrie, Director.

Coordinator of the Science Education Academy. Summer Youth Academy, University of Oklahoma, Norman, Oklahoma. July 1990 and July-August 1991. Development and teaching of a pre-

collegiate program in accelerated science for honors students. Dr. Edmund A. Marek, Director.

Chemistry Instructor in the Chemistry Academy. Summer Youth Academy, University of Oklahoma, Norman, Oklahoma. July 1990. Instruction of accelerated chemistry pre-collegiate program. Dr. Gordon Atkinson, Dir.

Chemistry Instructor. Summer Scholars Program, University of Oklahoma, Norman, Oklahoma. June 1989 and June 1990. Instruction of accelerated chemistry pre-collegiate program. Dr. Michael R. Abraham, Director.

Adjunct Mathematics Professor. Rose State College, Midwest City, Oklahoma. June 1988 to July 1988. Taught algebra classes. John Hansen, Department Head.

Adjunct Mathematics and Science Professor. Hillsdale Free Will Baptist College, Moore, Oklahoma. August 1987 to December 1988. Instructor of algebra, biology, and physical science. Dr. Thomas Marberry, Dir. of Instruction.

Office Manager/ Bookkeeper. Williamson & Associates, Inc., Norman, Oklahoma. December 1979 to January 1988. Construction bookkeeping, payroll, and all accounting reports for bonding purposes using computerized systems.

Secondary Science Teacher. Washington Public Schools, Washington, Oklahoma. August 1974 to December 1979. Duties included: teaching Chemistry I and II, Biology, Physiology, General Science, and Gifted & Talented classes (grades 1 -12); curriculum development; and evaluation.

Chemistry Department Tutor. Central State University; Edmond, Oklahoma. August 1973 to July 1974. Tutoring in general chemistry.

CONSULTATION WORK

Evaluator, NSF-funded grant "Before, During, and After Lecture Activities, John Gelder, Michael Abraham, PI's, 2012-2016.

Advisory Committee member, NSF-funded grant "Design of Electronic Learning Tools to Supplement General Chemistry Laboratory Experiments Using a Systematic Development Approach", Resa Kelly, PIs, 2009-2011.

Evaluator, NSF-funded Workshops and Minigrants, 2009 Gordon Research Conference on Visualization in Science and Education, Art Olson, conference chair, 2008-2011.

Evaluator, NSF-funded Workshops and Minigrants, 2007 Gordon Research Conference on Visualization in Science and Education, Chris Watters, conference chair, 2006-2009.

Evaluator, NSF-funded Workshops and Minigrants, 2005 Gordon Research Conference on Visualization in Science and Education, Peter Mahaffy, conference chair, 2004-2006.

Advisory Committee member, NSF-funded grant "Design Principles for Effective Molecular Animations", Loretta Jones, Barbara Tversky, Jerry Honts, Jerry Suits, David Falvo, PIs, 2005-2006.

Evaluator, NSF-funded Minigrants, 2003 Gordon Research Conference on Visualization in Science and Education, Mary Jane Shultz, conference chair, 2002-2005.

SCHOLARLY PAPERS/ BOOK CHAPTERS IN PREPARATION OR SUBMISSION

Clark, Morgan & Williamson, V.M. Effects of a structured exam review on student grades in general chemistry.

SCHOLARLY PAPERS/ BOOK CHAPTERS

Powell, C.B.; Simpson, J.; Williamson, V.M.; Dubrovskiy, A.V.; Walker, D.R.,; Jang, B.W-L..; Shelton, G.R.; & Mason, D. (2020). Impact of basic arithmetic automaticity on students' success in second-semester general chemistry. *Chemistry Education Research and Practice, 21, 1020-1027.* https://doi.org/10.1039/D0RP00006J

Alivio, T.E.G., Howard, E., Mamiya, B., Williamson, V.M. (2020). How does a math review impact a student's arithmetic skills and performance in first-semester general chemistry? *Journal of Science Education and Technology,* 29, 703–712. https://doi.org/10.1007/s10956-020-09851-7

Williamson, V.M.; Walker, D.R.,;Chuu, E.; Broadway, S.; Mamiya, B.; Powell, C.B.; Shelton, G.R.; Weber, R.; Dabney,. A.R.; & Mason, D. (2020). Impact of basic arithmetic skills on success in first-semester general chemistry. *Chemistry Education Research and Practice, 21*, 51 -61. https://doi.org/10.1039/C9RP00077A

Cosio, M.N., & Williamson, V.M. (2019). Timing of homework completion vs. performance in general chemistry. *Journal of Science Education and Technology, 28*, 523-531. https://doi.org/10.1007/s10956-019-09783-x

Albaladejo, J. DP.; Broadway, S., Mamiya, B.; Petros, A.; Powell, C. B.; Shelton, G. R.; Walker, D. R.; Weber, R.; Williamson, V. M.; Mason, D. (2018). ConfChem Conference on Mathematics in Undergraduate Chemistry Instruction: MUST-Know Pilot Study—Math Preparation Study from Texas. *Journal of Chemical Education*, *95*, 1428-1429. https://doi.org/10.1021/acs.jchemed.8b00096

Williamson, V.M., & Zumalt, C.J. (2017). How do general chemistry students' impressions, attitudes, perceived learning, and course performance vary with the arrangement of homework questions and E-text? *Chemistry Education Research and Practice, 18*, 785-797. https://doi.org/10.1039/c7rp00052a

Williamson, K.C., Williamson, V.M., Hinze, S. (2017). Administering spatial and cognitive instruments in-class and on-line: Are these equivalent? *Journal of Science Education and Technology*, *26*, 12-23. https://doi.org/10.1007/s10956-016-9645-1

Zumalt, C.J. & Williamson, V.M. (2016). Does the arrangement of embedded text versus linked text in homework systems make a difference in students' impressions, attitudes, and perceived learning. *Journal of Science Education and Technology*, *25*, 704-714. https://doi.org/10.1007/s10956-016-9625-5

Williamson, V.M. (2015). What is the research evidence for using visualization techniques in the chemistry classroom? How should these techniques be implemented? *LUMAT: International Journal on* Math, Science and Technology Education, *3*(4), 545-555. https://doi.org/10.31129/lumat.v3i4.1022

Hinze, S. R., Williamson, V. M., Shultz, M. J., Deslongchamps, G., Williamson, K. C., & Rapp, D. N. (2014). Spatial ability and learning from visualizations in STEM disciplines. In D. R. Montello, K. E. Grossner, & D. G. Janelle (Eds.). *Space in Mind: Concepts for Spatial Learning and Education*. Cambridge, MA: M.I.T. Press. 99-118.

Williamson, V. (2014). Teaching chemistry conceptually. Peer-reviewed chapter in Devetak, I., and Glazar, S. N. (Eds.) *Learning with Understanding in the Chemistry Classroom*. New York: Springer. 193-208.

Hinze, S. R., Williamson, V. M., Deslongchamps, G., Shultz, M. J., Williamson, K. C., & Rapp, D. N. (2013). Textbook treatments of electrostatic potential maps in general and organic chemistry. *Journal of Chemical Education, 90*(10), pp 1275–1281.

Williamson, V.M., Watkins, J.T., Williamson, K.C. (2013). The effect of student-constructed animations versus storyboards on students' mental rotation ability, equilibrium content knowledge and attitudes. Peer-reviewed chapter In J. Suits, & M. Sanger, (Eds) *Pedagogic Roles of Animations and Simulations in Chemistry Courses*, ACS Symposium Series. Washington, DC: American Chemical Society. 293-311.

Hinze, S.R., Williamson, V.M., Shultz, M.J., Williamson, K.C., Deslongchamps, G., & Rapp, D.N. (2013). When do spatial abilities support student comprehension of STEM visualizations? *Cognitive Processing – The International Quarterly of Cognitive Science*, *14*, 129-142

Hinze, S.R., Rapp, D.N., Williamson, V.M., Shultz, M.J., Deslongchamps, G., & Williamson, K.C. (2013). Beyond the ball-and-stick: Students' processing of novel STEM visualizations. *Learning and Instruction*, *26*, 12-21.

Williamson, V.M.; Hegarty, M.; Deslongchamps, G.; Williamson, K.; Shultz, M. (2013). Identifying student use of Ball-and-stick images vs. electrostatic potential map images via eye tracking. *Journal of Chemical Education, 90*(2), 159-164.

Williamson, V.M.; Lane, S.; Gilbreath, T.; Tasker, R.; Ashkenazi , G.; Williamson, K.C.; & MacFarlane, R. (2012). The effect of viewing order of macroscopic and particulate visualizations on students' particulate explanations. *Journal of Chemical Education, 89*(8), 979-987.

Williamson, V. (2011). Teaching chemistry with visualizations: What's the research evidence? Peer-reviewed chapter in D. Bunce, (Ed) *Investigating Classroom Myths through Research on Teaching and Learning*. Washington, DC: American Chemical Society. 65-81.

Hinze, S. R., Rapp, D. N., Williamson, V. M., Shultz, M., Williamson, K. C., & Deslongchamps, G. (2011). Unlocking potential: Individual differences in the use of concurrent scientific visualizations. Peer-reviewed paper in Carlson, L., Hoelscher, C., & Shipley, T.F. (Eds) *Proceedings of the Annual Conference of the Cognitive Science Society*. 2721-2726.

Chatterjee, S., Williamson, V.M., McCann, K., & Peck, L. (2009). Surveying students' attitudes and perceptions towards guided-inquiry and open-inquiry laboratories *Journal of Chemical Education, 86*(12), 1427-1432.

Williamson, V.M. & Jose, T.J. (2009). Using visualization techniques in chemistry teaching. Peer-reviewed chapter in N.J. Pienta, M.M. Cooper, & T.J. Greenbowe, (Eds) *Chemists' Guide to Effective Teaching*, Volume 2. Upper Saddle Rive, N.J: Prentice Hall. 71-88.

Williamson, V.M. (2008). The particulate nature of matter: An example of how theory-based research can impact the field. Peer-reviewed chapter In D. Bunce, & R. Cole, (Eds) *Nuts and Bolts of Chemical Education Research*, Washington, DC: American Chemical Society. 67-78.

Williamson, V.M. & Jose, T.J. (2008). Effects of a two-year molecular visualization experience on teachers' attitudes, content knowledge, and spatial ability. *Journal of Chemical Education*, *85*(5), 718-723

McKee, E., Williamson, V.M., & Ruebush, L.E. (2007). Effects of a demonstration laboratory on student learning. *Journal of Science Education and Technology*. *16*, 395–400.

Williamson, V.M., Brown, L.M., Peck, M.L., & Simpson, M. (2005). Facilitators and barriers to teacher implementation of molecular visualization. *The Texas Science Teacher*, *34*(2), 12-16.

José, T.J. & Williamson, V.M. (2005) Molecular visualization in science education: An evaluation of the NSF – funded workshop. *Journal of Chemical Education*, *82*(6), 937-943.

Velázquez-Marcano, A, Williamson, V.M., Ashkenazi, G, Tasker, R, Williamson, K.C. (2004). The use of video demonstrations and particulate animation in the general chemistry. *Journal of Science Education and Technology*, *13*(3), 315-323.

Williamson, V.M., Huffman, J., & Peck, M.L. (2004). Testing student's use of the particulate theory. *Journal of Chemical Education*, *81*(6), 891-896.

Williamson, V.M. & Rowe, M.W. (2002). Group problem solving versus lecture in college-level quantitative analysis: The good, the bad, and the ugly. *Journal of Chemical Education*, *79*(9), 1131-1134.

Williamson, V.M., & Abraham, M.R. (1995). The effects of computer animation on the particulate mental models of college chemistry students. *Journal of Research in Science Teaching*, *32*(5), 521-534.

Abraham, M. R., Williamson, V.M., & Westbrook, S.L. (1994). A cross-age study of the understanding of five chemistry concepts. *Journal of Research in Science Teaching*, *31*(2), 147-165.

Abraham, M. R., & Williamson, V.M. (1992). Integrating the laboratory and lecture with computers. In W.J. McIntosh & M.W. Caprio (Eds.) *Successful Approaches to Teaching Introductory Science Courses*, (Monographs of the Society for College Science Teachers, Monograph 3), 21-28.

Williamson, V.M. (1992). The effects of computer animation emphasizing the particulate nature of matter on the understandings and misconceptions of college chemistry students. Unpublished doctoral dissertation, University of Oklahoma.

VICKIE M. WILLIAMSON

PUBLISHED TEXTBOOKS AND CURRICULUM MATERIALS

Williamson, V.M., Peck, M.L., & McCann, K. (2018). *Experiences in Chemistry: Inquiry and Skill Building, 3rd Edition,* Belmont, CA: Brooks/Cole Publishing.

Williamson, V.M. & Peck, M.L. (2014). *Experiences in Chemistry: Inquiry and Skill Building, 2nd Edition,* Belmont, CA: Brooks/Cole Publishing.

Williamson, V.M. (2012). *Instructor's Manual for Whitten, Davis, Peck, and Stanley's General Chemistry*, 10th ed., Belmont, CA: Brooks/Cole Publishing

Williamson, V.M. (2010). *Instructor's Manual for Whitten, Davis, Peck, and Stanley's General Chemistry*, 9th ed., Belmont, CA: Brooks/Cole Publishing

Williamson, V.M. & Peck, M.L. (2009). *Experiences in Chemistry: Inquiry and Skill Building,* Belmont, CA: Brooks/Cole Publishing.

Williamson, V. (Chair); Jose, T.; Kelly, R.; Kimbrough, D.; Langdon, L.; Lewis, S.; Lewis, J.; March, J.; Mason, D.; Milne, R.; Monteyne, K.; Nakhleh, M.; Robinson, B.; Sanger, M.; Schneider, J.; Shih, S.; Yezierski, E. (2008). *2008 ACS Conceptual General Chemistry Examination.* Milwaukee, WI, ACS Division of Chemical Education Examinations Institute

Williamson, V.M. & Peck, M.L. (2007). *Inquiry-Based Laboratories for Liberal Arts Chemistry,* Belmont, CA: Brooks/Cole Publishing.

Williamson, V.M. (2006). *Instructor's Manual for Whitten, Davis, Peck, and Stanley's General Chemistry*, 8th ed., Belmont, CA: Brooks/Cole Publishing

Bunce, D. (Chair), Bauer, C.F.; Cole, R.; Langdon, L.; Nakhleh, M.; Nurrenbern, S.; Robinson, B.; Smith, C.; Towns, M.; VandenPlas, J.; Williamson, V. (2007). *ACS Second Term General Chemistry Paired Questions Examination*. Milwaukee, WI, ACS Division of Chemical Education Examinations Institute

Peck, M.L., & Williamson, V.M. (2002-2006). *Experiences in Chemistry: Inquiry and Skill Building-II* (1st-3rd Edition). Plymouth, MI: Hayden-McNeil Publishing, Inc.

Peck, M.L., & Williamson, V.M. (2001-2006). *Experiences in Chemistry: Inquiry and Skill Building-I* (1st-3rd Edition). Plymouth, MI: Hayden-McNeil Publishing, Inc.

Bunce, D. (Chair), Bauer, C.F.; Cole, R.; Langdon, L.; Nakhleh, M.; Nurrenbern, S.; Robinson, B.; Smith, C.; Towns, M.; VandenPlas, J.; Williamson, V. (2005). *ACS First Term General Chemistry Paired Questions Examination*. Milwaukee, WI, ACS Division of Chemical Education Examinations Institute

Williamson, V.M. (2004). *Instructor's Manual for Whitten, Davis, Peck, and Stanley's General Chemistry*, 7th ed., Belmont, CA: Brooks/Cole Publishing

Bauer, C.F.; Birk, J; Bowen, C.; Bracken, J.D.; Brooks, K.; Foxman, B.; Francisco, J.; Frank, D.; Gammon, S.D.; Kimbrough, D.; LaPorte, M.; Lewis, E.; March, J.; Metz, P.; Nurrenbern, S.; Phelps, A.; Robinson, B. (Chair); Russell, J.; Sawrey, B.; Williamson, V.; Wink, D. (2001). *2001 ACS Conceptual General Chemistry Examination*. Clemson, S.C., ACS Division of Chemical Education Examinations Institute

Williamson, V.M., & Kennicutt, W. (1999). *Holt Chemfile Interactive Tutor* [a chemistry CD for high school students to accompany Holt's *Modern Chemistry* Textbook] Austin, TX: Holt, Rinehart, and Winston.

Hovde, R, Shea, T., Shook, S. Williamson, V.M., et al. (1999). *Integrated Science, Mathematics, and Technology: Waste Management.* Peoria, IL: Glencoe Publishing. (Middle School Teacher Edition, Student Edition, and Student Journal)

Hovde, R, Shea, T., Shook, S. Williamson, V.M., et al. (1999). *Integrated Science, Mathematics, and Technology: Energy Transformations*. Peoria, IL: Glencoe Publishing. (Middle School Teacher Edition, Student Edition, and Student Journal)

Hovde, R, Shea, T., Shook, S. Williamson, V.M., et al. (1998). *Integrated Science, Mathematics, and Technology: Food Production*. Peoria, IL: Glencoe Publishing. (Middle School Teacher Edition, Student Edition, and Student Journal)

Hovde, R, Shea, T., Shook, S. Williamson, V.M., et al. (1998). *Integrated Science, Mathematics, and*

Technology: Wellness. Peoria, IL: Glencoe Publishing. (Middle School Teacher Edition, Student Edition, and Student Journal)

NEWSLETTERS AND OTHER NONREFEREED PUBLICATIONS

Newsletters:

Williamson, V.M. (Spring 2013) Committee on Chemical Education Research. A report in the ACS Division of Chemical Education (CHED) Newsletter, 22-23. Accessible from http://www.divched.org/content/ched-newsletter-spring-2013-edition

Williamson, V.M. (Fall 2012) Committee on Chemical Education Research. A report in the ACS Division of Chemical Education (CHED) Newsletter. 27-28. Accessible from http://www.divched.org/content/ched-newsletter-fall-2012-edition.

Williamson, V.M. (Spring 2012) Committee on Chemical Education Research. A report in the ACS Division of Chemical Education (CHED) Newsletter, 40-41. Accessible from http://www.divched.org/content/spring-2012-newsletter.

Williamson, V.M. (Winter 2011) Committee on Chemical Education Research. A report in the ACS Division of Chemical Education (CHED) Newsletter, 23. Accessible from http://www.divched.org/content/winter-2011-newsletter

Williamson, V.M. (Fall 2011) Committee on Chemical Education Research. A report in the ACS Division of Chemical Education (CHED) Newsletter, 27-28. Accessible from http://www.divched.org/content/fall-2011-newsletter.

Williamson, V.M. (Fall 2011) Peer-Reviewed Chemical Education Research Symposium. A report in the ACS Division of Chemical Education (CHED) Newsletter. Accessible from http://www.divched.org/content/fall-2011-newsletter.

Williamson, V.M. (Fall 2010) ACS Award for Achievement in Research for the Teaching and Learning of Chemistry: Symposium in honor of Michael R. Abraham. A report in the ACS Division of Chemical Education (CHED) Newsletter, 31-32.

Williamson, V.M., & Jose, T. (Fall 2006) Research in Chemical Education Symposium. A report in the ACS Division of Chemical Education (CHED) Newsletter, 50-51.

Williamson, V.M., & Mason, D. (Fall 2003) Research in Chemical Education Symposium. A report in the ACS Division of Chemical Education (CHED) Newsletter, 47-48.

Textbook Reviews:

For Saunders College Publishing, General Chemistry by Whitten, Davis, & Peck, 1996 (fifth edition). Reviewed in 1997.

For West Educational Publishing, eight chapters from Preparatory Chemistry: a Chemical Primer (prepublication)by Steven Ruis. Reviewed in 1996.

For Wm. C. Brown Publishers, nine chapters from Fundamentals of Chemistry by David Goldberg, 1994 (first edition). Reviewed in 1995.

FUNDED GRANTS

Rapp, D., Shultz, M., Deslongchamps, G., Williamson, V.M., & Williamson K.C. (2009-2012; extended until Aug 2013). "Students' Attempts at Understanding the Unobservable: A Multi-Method Approach to Visualization Analysis and Design" $684,000 (141,600 to TAMU), REESE, NSF #098130. Funding to conduct a research study using eye-tracking technology to investigate what part of visuals that students use when problem solving.

Shultz, M.J., Hegarty, M., Stieff, M, Deslongchamps, G., & Williamson, V.M., (2005-2006). "Student View of Visualizations: What do They See?" (Molecular Visualization and Science Education: Research) $5,000 Beloit College/NSF flow-through. Funding to conduct a research study using eye-tracking technology to investigate what part of visuals that students use when problem solving.

Williamson, K.C., Williamson, V.M. & Bryant, J. (2003-2004). "Energy, Equilibrium, Conservation, and Conversion in Materials Science" $168,843. Information Technology in Science Center for Teaching and Learning; Texas A&M University/NSF flow-through. Three-week workshop for teachers/ community college instructors during each of two summers that focused on energy conservation, materials used, and molecular visualization, implementation of information technology into the classroom, and action research projects to access the effectiveness.

Williamson, V.M. (2001-2003) "Molecular Visualization and Science Education: Evaluation" $13,933. University of Northern Colorado/NSF flow-through.

Williamson, V.M., Tasker, R, & Ashkenazi ,G. (2001-2002). "Visualization to Promote Conceptual Change" (Molecular Visualization and Science Education: Research) $5,000. University of Northern Colorado/NSF flow-through. Funding to conduct a research study concerning the effectiveness of animations and video demonstrations on students' conceptual change.

Williamson, V.M., Lindhal, P. & Romo, D. (2000-2002). "Structure & Properties of Matter and Chemical Reactions" $166,000. Information Technology in Science Center; Texas A&M University/NSF flow-through. Three-week workshop for teachers/ community college instructors during each of two summers that focused on molecular visualization, its implementation into the classroom, and action research projects to access its effectiveness.

Williamson, V.M., & Peck, M.L. (2000-2001) ."Molecular Visualization On-line Module" $6,000. Regents' Initiative Fellowship Grant. Funding to create a website with links to molecular visualizations for general chemistry.

Foster, E., Williamson, V.M., & Self, N. (2000-2001). "Effective Teacher Preparation: Comparison of Professional Development School Interns, Integrated Methods School Interns and Year-long Inquiry Project Interns and Their Effect on Student Success in Public School" $35,000. Texas A & M University Regents' Initiative Collaborative Research Grants. Research into the changes in the reasoning abilities of elementary pre-service teachers who were in an inquiry program.

Williamson, V.M., & Anderson, R.C. (1996-1997). "Peer Assisted Project for Enhancing Elementary Science" $61,980. Scientific Literacy Program of the Illinois State Board of Education. P.I. and fiscal agent for this four-week project which teamed teachers with graduate students for a half-day research component and teamed two teachers for a half-day science education component.

Williamson, V.M., & Anderson, R.C. (1996) ."Peer Assisted Project for Enhancing Elementary Science" $58,000. Eisenhower Professional Development Program. State of Illinois Board of Higher Education. P.I. and fiscal agent for this four-week project which teamed teachers with graduate students for a half-day research component and teamed two teachers for a half-day science education component.

Williamson, V.M., & Anderson, R.C. (1994-1995). "Peer Assisted Approach to Enhance Science Perception and Curriculum Development of Preservice and Inservice Elementary Teachers" $64,330. Scientific Literacy Program of the Illinois State Board of Education. P.I. and fiscal agent for this four-week project which teamed teachers with graduate students for a half-day research component and teamed two teachers together for a half-day science education component.

HONORS AND AWARDS

University Professorship in Undergraduate Teaching Excellence, Texas A&M University, 2018-2021.

Outstanding Undergraduate Science Teacher Award (OUSTA), from the Society for College Science Teachers, 2017.

American Chemical Society Fellow, awarded for contributions to science and service to the organization in August 2015.

American Chemical Society Award for Achievement in Research for the Teaching and Learning of Chemistry, awarded for cutting-edge contributions in chemical education research on the visualization of the particulate nature of matter in March 2015.

Distinguished Achievement Award in Teaching-University Level. The Association of Former

Students, Texas A&M University, 2014.

Awardee for Student-Led Award for Teaching Excellence (SLATE), Texas A & M University, Fall 2009

College Board Advanced Placement® Best Practices Course, 2006 My course identified as an example of best practices in a national study of 166 courses conducted by the Center of Educational Policy Research on behalf of the College Board.

Distinguished Achievement College-Level Award in Teaching for the College of Science. The Association of Former Students, Texas A&M University, 2003.

Fish Camp Namesake, Freshman Orientation Camp Elections, Texas A&M University, 2001.

Member, Texas A & M Reagents' Initiative, Academy for Educator Development, (2000 induction). 2000- 2006 when it was dissolved.

Outstanding Dissertation Award, University of Oklahoma, 1992-93.

Finalist for the Dissertation Award, the National Association for Research in Science Teaching; one of three finalists nationwide, 1991-1992.

Graduate Teaching Assistant Excellence Award, Department of Chemistry and Biochemistry, University of Oklahoma, Norman, Oklahoma, 1992.

Outstanding Presenter in Social Sciences & Education, Graduate Student Recognition Day, University of Oklahoma, 1990. Poster presented research on students' conceptions of selected chemistry topics.

Teacher of the Year, Washington High School, Washington, Oklahoma, 1978.

Cum Laude graduate; Central State University; Edmond, Oklahoma, 1974.

Physics Beginning Achievement Award; Central State University; Edmond, Oklahoma, 1974.

INVITED TALKS, SEMINARS, AND WORKSHOPS

Supporting the Unprepared Student, Virtual Conference Presentation, Summer of Learning Webinar Series for Math & Science Faculty, held by Cengage Learning, July 22, 2020.

Preventing Cheating and Delivering Exams with OWLv2, Virtual Conference Presentation, Summer of Learning Webinar Series for Math & Science Faculty, held by Cengage Learning, July 23, 2020.

The Quest for Student Understanding: Transforming Students and Myself, TAMU Transformational Teaching and Learning Conference, May 2, 2019. Awardee Address for University Professorship for Undergraduate Teaching Excellence.

Visualizing Chemistry Concepts, Seminar Speaker, Chemistry Department, Purdue University, West Lafayette, IN, October 4, 2017.

Chemistry Digital User Summit, Integrated Homework and Textbook, Speaker, San Francisco, CS, August 4, 2017.

The Case for Electronic Homework, Speaker, Blinn College, Bryan, TX, March 3, 2017.

Techniques to Help Students Build Mental Models for Conceptual Learning and Visualization, invited 1.5-hour session at the college faculty development session, Galveston College, Galveston, TX, January 6, 2017.

Teaching Chemistry with Visualizations: Research and Techniques, Seminar for the Chemistry Department, Texas State University, San Marcos, TX, October 3, 2016.

Techniques to Teach Chemistry Conceptually: What Techniques Help, Keynote Speaker- New Strategies for Chemistry Education Today Conference, held by Cengage Learning, Orlando, FL, February 28, 2015.

Teaching Chemistry Conceptually, Keynote Speaker- Chemistry Section, Annual Meeting of the Texas Community College Teacher Association, Dallas, TX, February 21, 2015.

Teaching Conceptually Through Inquiry, Seminar Speaker for all Faculty, Northwestern Oklahoma State University, Alva, OK, August 12, 2014

Teaching Science with Visualizations, Seminar Speaker, Department of Natural Science, Northwestern Oklahoma State University, Alva, OK, August 13, 2014

What is the research evidence for using visualization techniques in the chemistry classroom? How should these techniques be implemented**?** Invited Plenary Speaker, European Conference on Research in

Chemistry Education, Jyväskylä, Finland July 2014.

Students Attempts at Understanding the Unobservable. Keynote speaker, 2011 Gordon Research Conference: Visualization in Science Education. Smithfield, RI, July 12, 2011

Why use Visualization Techniques in the Classroom? What is the Research Evidence? Keynote speaker, 2009 Gordon Research Conference: Chemical Education Research and Practice. Waterville, ME, June 24, 2009

Learning OWL Workshop, University of Massachusetts, Amherst, MA, November 14-15, 2008. Co-Presenter

Visualization Techniques for Teaching Chemistry: Relying on Old and New Technologies; Keynote Address at the 178th Conference of the Two-Year College Chemistry Consortium, Paramus, NJ September 28, 2007

Particulate Mental Models: The Quest for Student Understanding. Seminar speaker, Department of Chemistry, Purdue University, West Lafayette, IN, November 15, 2006.

A Retrospective on 2001 and 2003 Mini-grants: What the Data Indicates About Success. Invited Speaker. NSF Workshop: Future Directions for Visualizations in Science and Education, NSF Headquarters, September 26, 2006.

OWL Electronic Homework Workshop, University of North Texas, Denton, TX, March 3-4, 2006.

The Quest to Improve Student Understanding: Current Research Findings. Seminar speaker, Department of Chemistry, University of Michigan, Ann Arbor, MI, February 17, 2005.

Chemistry Component of the PreAP® Middle School Science Summer Institute at Texas A&M University, August 1-5, 2005.

How to Ace Freshman Chemistry. Seminar Speaker, Genetics and Biochemistry Enrichment Experience, Texas A&M University, September 2003.

Using the OWL electronic homework system. Seminar speaker, Chemistry Division, Blinn College, May 2003.

Using the OWL electronic homework system. Seminar speaker, Department of Chemistry, Prairie View University, February 2003.

The Quest to Improve Student Understanding: Research findings on visualizations, Verbalizations, and Group Problem Solving. Seminar speaker, Department of Chemistry, University of South Florida, Tampa, FL, October 24, 2002.

The Quest to Improve Student Understanding: Research findings on visualizations, Verbalizations, and Group Problem Solving. Seminar speaker, Department of Chemistry, University of North Texas, Denton, TX, October 4, 2002.

What is an Academic Leader? Keynote speaker at the General O.R. Simpson Corps Honor Society Induction Banquet, December 5, 2001.

Science in a Scientific Classroom. Presenter of this full-day workshop for the science teachers of Normal Public Schools held February 15, 1997.

The Learning Cycle as an Instructional Strategy for Science. Co-presenter of this workshop for the science teachers of Decatur Public Schools (held February 1996), Manito Public Schools (June 3, 1996), and Momence Public Schools (June 4, 1996).

Hands-on, Learning Cycles, Constructivism, and Science Workshop. Director and presenter of this four-week, one-half day workshop from the Peer Assisted Approach to Enhance Science Perception and Curriculum Development of Preservice and Inservice Elementary Teachers' grant. June-July 1995.

The Learning Cycle as an Instructional Strategy for Science. Presenter of this workshop to the elementary teachers at Blooming Grove Academy. August 1994.

Polymer Power Workshop. Presenter of session examining the properties of polymers. Expanding Your Horizons Through Science and Mathematics Conference for girls in grades 6-10. Illinois State University. April 1994, March 1995, & March 1996.

Hands-on Physical Science Activities Summer Workshop. Co-presenter of methods and content instruction for upper elementary and middle school teachers offered through the Department of

Chemistry and Biochemistry. University of Oklahoma. August 1992.

Teaching Assistant Workshop. Co-presenter of methods and content instruction for new teaching assistants in the Department of Chemistry and Biochemistry. University of Oklahoma. Fall 1989, 1990, and 1991.

What I Wish Someone Had Told Me When I Was a New T.A. Co-leader for the Math and Natural Sciences panel, All-T.A. Training, University of OK. Fall 1989.

Inquiry Teaching Strategies. Session presented at teacher workshop for elementary teachers at Washington Public Schools in preparation for implementing the Learning Science Program. Fall 1977.

PRESENTATIONS

Williamson, V.M. & Keeney-Kennicutt, W. (2020). Exploring the impacts of implementing a flipped classroom . 2020 Biennial Conference on Chemical Education. Abstract accepted March 31, 2020. Because of the global COVID-19 pandemic, the 2020 Biennial Conference on Chemical Education was terminated on April 2, 2020, by the Executive Committee of the Division of Chemical Education, American Chemical Society; and, therefore, this presentation could not be given as intended

Clark, M.J., & Williamson, V.M. (2020). Effects of implementing structured reviews of completed lecture exams on content retention for general chemistry students . 2020 Biennial Conference on Chemical Education. Abstract accepted March 31, 2020. Because of the global COVID-19 pandemic, the 2020 Biennial Conference on Chemical Education was terminated on April 2, 2020, by the Executive Committee of the Division of Chemical Education, American Chemical Society; and, therefore, this presentation could not be given as intended

Williamson, V.M. (2019, May). Partnering with Undergraduate Research Assistants to Pursue Scholarship of Teaching & Learning (SoTL): Sharing a Successful Model. Presentation at the TAMU Transformational Teaching and Learning Conference, College Station, TX.

Williamson, V.M. (2019, April).The relationship of mathematics fluency and success in general chemistry: How collaborations lead to better research. Paper presented at the 257th National Meeting of the American Chemical Society. Orlando, FL.

Willis, W.K, .& Williamson, V.M. (2019, April).Analyzing mathematics fluency, course averages, and algorithmic and conceptual common question scores: Statistical modeling gives a clearer picture. Paper presented at the 257th National Meeting of the American Chemical Society. Orlando, FL.

Willis, W.K. .& Williamson, V.M. (August, 2018). Diagnostic identifiers of at-risk students in first and second-semester general chemistry. Paper presented at the 25th Biennial Conference on Chemical Education. Notre Dame, South Bend, IN

Cusio, M.& Williamson, V.M. (August, 2018). How does timing of homework completing effect retention of knowledge in general chemistry? Paper presented at the 25th Biennial Conference on Chemical Education. Notre Dame, South Bend, IN

Sophos, J.M.; Carmel, J.; Cole, R.S.; Donnelly, S.J.; Levy, I.J.; Mooring, S.R.; Orgill, M.; Putti, A.; Sorensen-Unruh, C.; Sykes, D.G.; Williamson, V.M. (July, 2018). Biennial Conference on Chemical Education: A place to share information about the teaching and learning of chemistry. Poster Presentation at the 25th Biennial Conference on Chemical Education. Notre Dame, South Bend, IN

Williamson, V.M. (2018, March) What is the relationship between a students' profile and their success on common questions in first-semester general chemistry? Paper presented at the 255th National Meeting of the American Chemical Society. New Orleans, LA.

Williamson, V.M. (2018, March) Helping students succeed with a digital product. Paper presented at the 71st Annual Convention of the Texas Community College Teachers Association, Frisco, TX.

Mason, D.S.;Mamiya, B.;Powell, C.;Shelton, G.R.;Williamson, V. (2017, October) Texas Math Gap. Paper presented at the Southwest Regional Meeting of the American Chemical Society. Lubbock, TX.

Petros, A.; Weber, R.; Broadway, S.; Ford, R.; Powell, C.; Hunter, K.; Williamson, V.; Walker, D.; Mamiya, B.; Del Pilar, J.; Shelton, G.R.; Mason, D. (2017, October 23-29) The MUST-Know Pilot—Math Preparation Study from Texas. ACS DivCHED CCCE (Committee on Computers in Chemical Education) online conference organized by Cary Kilner and Eric Nelson: https://confchem.ccce.divched.org/2017FallConfChem (last accessed October 23, 2017).

Williamson, V.M. (2017, March) The challenge to improve student understanding. Paper presented at 2017 National Meeting of the Society for College Science Teachers, a division of the National Science Teachers Association. Los Angeles, CA.

Williamson, V.M. & Zumalt, C.J. (2016, August). What are the variances in student attitudes towards a homework system with text and embedded questions immediate vs. delayed? Paper presented at the 24th Biennial Conference on Chemical Education. Greeley, CO.

Zumalt, C.J. & Williamson, V.M. (2016, August). Does order of use make a difference? Perceived learning and attitudes towards a homework system with linked text vs. one with questions embedded in the text. Paper presented at the 24th Biennial Conference on Chemical Education. Greeley, CO.

Zumalt, C.J. & Williamson, V.M. (2016, March) Semester long use of two different homework systems: Comparison of student learning, perceived learning, and attitudes. Paper presented at the 251st National Meeting of the American Chemical Society. San Diego, CA.

Williamson, V.M. (2015, March). Award Address: Quest for student understanding of the particulate nature of matter. Paper presented at the 249th National Meeting of the American Chemical Society. Denver, CO.

Zumalt, C.J. & Williamson, V.M. (2015, March). Linked text versus embedded text in two homework systems: Student impressions, attitudes, and perceived learning. Paper presented at the 249th National Meeting of the American Chemical Society. Denver, CO.

Williamson, V.M., & Zumalt, C.J. (2014, August). Linked text versus embedded text in two homework systems: Student impressions, attitudes, and perceived learning. Paper presented at the 248th National Meeting of the American Chemical Society. San Francisco, CA.

Williamson, V.M. (2014, August). Lessons taught and lessons learned: Advice for the new/returning professor. Paper presented at the 23rd Biennial Conference on Chemical Education. Grand Valley, MI.

Zumalt, C.J. & Williamson, V.M. (2014, August). Student impressions, attitudes, and perceived learning with two homework systems. Paper presented at the 23rd Biennial Conference on Chemical Education. Grand Valley, MI.

Hinze, S.R., Williamson, V.M., & Williamson, K.C. (2014, March) Administering cognitive tests in-class and on-line: Are there the links between these tests and grades in a chemistry course? Paper presented at the 247th National Meeting of the American Chemical Society. Dallas, TX.

Williamson, V.M., Casillas, C., & Zumalt, C. (2014, March) Student impressions, attitudes, and perceived learning with two homework systems. Poster presented at the 247th National Meeting of the American Chemical Society. Dallas, TX.

Casillas, C., Sarvela, T. L., & Williamson, V.M. (2014, March). Measuring the Effects of Online Homework on Student Content Retention in First Semester General Chemistry. Poster presented at the 247th National Meeting of the American Chemical Society. Dallas, TX.

Williamson, V.M., Hinze, S.R., Williamson, K.C., Shultz, M., Deslongchamps, G., & Rapp, D. (2013, November). The role of spatial abilities in the use of macroscopic and particulate representations Paper presented at the Southwest Regional Meeting of the American Chemical Society. Waco, TX.

Williamson, V.M., & Mawk, E.J. (2012, August). Atoms first lecture: How to adapt to a textbook and laboratory that does not follow this order. Paper presented at the 22nd Biennial Conference on Chemical Education. State College, PA.

Hinze, S., Williamson, V.M., Williamson, K., Shultz M., Deslongchamps, G., & Rapp, D. (2012, August). The role of prediction tasks and spatial abilities in the use of macroscopic and particulate representations. Paper presented at the 22nd Biennial Conference on Chemical Education. State College, PA.

Williamson, V.M., Hinze, S., Deslongchamps, G., Shultz M., Williamson, K., & Rapp, D. (2012, August). Electrostatic potential maps: How are these visualizations used in general and organic chemistry textbooks? Paper presented at the 22nd Biennial Conference on Chemical Education. State College, PA.

Williamson, V.M. (2012, March). Visualizations to promote student understanding: Influences of Loretta Jones. Paper presented at the 243rd National Meeting of the American Chemical Society. San Diego, CA.

Williamson, V.M. (2011, November) Using visualization techniques in general chemistry. Paper presented at the 67th Southwest Regional Meeting of the American Chemical Society. Austin, TX.

Williamson, V.M. (2011, August). Clickers in a large lecture class: Student impressions and perceived learning. Paper presented at the 242nd National Meeting of the American Chemical Society. Denver, CO.

Williamson, V.M., Hinze, S., Williamson, K., Shultz M., Deslongchamps, G., & Rapp, D. (2011, August). Students' cognitive processing and comprehension of macroscopic and particulate representations. Paper presented at the 242nd National Meeting of the American Chemical Society. Denver, CO.

Williamson, V.M., Hinze, S., Williamson, K., Shultz M., Rapp, D., & Deslongchamps, G. (2011, March). Which visualizations are students able to use effectively? Paper presented at the 241st National Meeting of the American Chemical Society. Anaheim, CA.

Williamson, V.M. (2010, August). Ten years of OWL: Impressions and findings. Paper presented at the 21st Biennial Conference on Chemical Education. Denton, TX.

Mawk, E.J. & Williamson, V.M. (2010, August). Using screencasts for examination reviews: Student and instructor impressions. Paper presented at the 21st Biennial Conference on Chemical Education. Denton, TX.

Williamson, V.M. (2010, April). Evaluation of workshops, effect of visionary grant process on GRC attendees, and visionary grants. Presented at the National Science Foundation during the Future Directions for Visualizations in Science and Education Workshop. Arlington, VA.

Williamson, V.M. (2010, April) Teaching chemistry with visualizations. Presented at the 55th Annual ACS PentaSectional Meeting, Norman, OK.

Williamson, V.M. (2010, March). The particulate nature of matter: How do we make them see? Paper presented at the 239th National Meeting of the American Chemical Society. San Francisco, CA.

Williamson, V.M. & Jose, T. J. (August, 2009). Using visualization techniques in chemistry teaching. Paper presented at the 238th National Meeting of the American Chemical Society. Washington, DC.

Williamson, V.M. (2009, July). ChemSense vs. storyboards: What is the effect on general chemistry students' mental rotation ability, content knowledge, and attitudes? Poster presented at the 2009 Gordon Research Conference on Visualization and Science Education, Oxford, UK.

Watkins, J.T. & Williamson, V.M. (2009, Mar.) Changes in students' spatial ability, content knowledge, and attitudes through the use of storyboards and student-constructed animation in college general chemistry. Paper presented at the 237th ACS National Meeting, Salt Lake City, UT.

Williamson, V.M. & Mawk, E.J. (2008, July). Creation and use of screencasts for large lecture exam reviews using Macintosh computers: Part 1 & 2. Paper presented at the 20th Biennial Conference on Chemical Education. Bloomington, IN.

Williamson, V.M. (2008, July). Teaching general chemistry for student understanding: Research findings and teaching techniques. Paper presented at the 20th Biennial Conference on Chemical Education. Bloomington, IN.

Williamson, V.M. (2008, May). Assessment of 2005 and 07 pre-conference workshops: Suggestions for change & Assessment of 2001/03/05 mini-grant awards: Suggestions for change. Papers presented at the National Science Foundation during the Future Directions for Visualizations in Science and Education Workshop. Arlington, VA.

Williamson, V.M. (2008, March). The particulate nature of matter: The quest for student understanding. Paper presented at the Symposium in honor of Dorothy L. Gable at the 235th National Meeting of the American Chemical Society. New Orleans, LA

Mawk, E.J. & Williamson, V.M. (2008, Feb). The Creation & Use of Screencasting For Macs. Paper presented at the Teaching With Technology Conference, Texas A&M University, College Station, TX.

Sarvela, T., Williamson, V.M. & MacFarlane, R. (2007, August). Feedback and attitude study of online web-based learning (OWL) in first semester general chemistry. Paper presented at the 234th National Meeting of the American Chemical Society. Boston, MA.

Gilbreath, T., Williamson, V.M. & MacFarlane, R. (2007, August). The effect of macroscopic and particulate visualizations on student reasoning. Paper presented at the 234th National Meeting of the American Chemical Society. Boston, MA.

Gilbreath, T., Williamson, V.M. & MacFarlane, R. (2007, July). The effect of macroscopic and particulate visualizations on student reasoning. Poster presented at the 2007 Gordon Research Conference on Visualization and Science Education & Gordon Research Conference on Chemical Education Research and Practice. USA.

Sarvela, T., Williamson, V.M. & MacFarlane, R. (2007, March). Feedback and attitude study of online web-based learning (OWL) in first semester general chemistry. Poster presented at the 233rd National Meeting of the American Chemical Society. Chicago, IL.

Williamson, V.M. (2006, Oct.). Teaching general chemistry for student understanding. Paper presented at the Southwest Regional Meeting of the American Chemical Society. Houston, TX.

Jose, T. & Williamson, V.M. (2006, Oct.). Using visualization techniques in chemistry teaching. Paper presented at the Southwest Regional Meeting of the American Chemical Society. Houston, TX.

Williamson, V.M. (2006, September). A retrospective on 2001, 2003, and 2005: What the data indicates about success. Paper presented at the National Science Foundation during the Future Directions for Visualizations in Science and Education Workshop. Arlington, VA.

Williamson, V.M. (2006, September). Visualization to Promote Conceptual Change. Poster presented at the National Science Foundation during the Future Directions for Visualizations in Science and Education Workshop. Arlington, VA.

Williamson, V.M. & Tate, S. (2006, September). Historical analysis of student performance in junior level chemistry courses. Paper presented at the 232nd National Meeting of the American Chemical Society. San Francisco, CA.

Jose, T. & Williamson, V.M. (2006, July). Using visualization techniques to promote mental models in chemistry classrooms. Paper presented at the19th Biennial Conference on Chemical Education. West Lafayette, IA.

Williamson, V.M., Chatterjee, S., & Peck, M.L. (2006, July). Students' perceptions and attitudes towards guided and open inquiry laboratories. Paper presented at the19th Biennial Conference on Chemical Education. West Lafayette, IA.

Williamson, V.M., & Shank, P. (2006, March) "That's what happens": Exposing students' mental models of chemistry through drawing and animation. Paper presented at the 231st National Meeting of the American Chemical Society. Atlanta, GA.

Williamson, V.M., Simpson, M.J., Ashkenazi, G, Tasker, R. & Williamson, K. (2006, March) Does the order of video demonstrations and animations affect students' particulate explanations? Paper presented at the 231st National Meeting of the American Chemical Society. Atlanta, GA.

Chatterjee, S., Williamson, V.M., & Peck, M.L. (2006, March). Students' perceptions and attitudes towards guided and open inquiry laboratories. Paper presented at the 231st National Meeting of the American Chemical Society. Atlanta, GA.

Chatterjee, S., Williamson, V.M., & Peck, M.L. (2006, March) Teaching chemistry using role-playing techniques. Paper presented at the 231st National Meeting of the American Chemical Society. Atlanta, GA.

Williamson, V.M., Velazquez, A, Simpson, M.J., Tasker, R, Ashkenazi, G, Williamson, K. (2005, July). The use of video demonstrations and particulate animations in the chemistry classroom. Poster presented at the 2005 Gordon Research Conference on visualization and science education. Oxford, UK.

Williamson, V.M., Simpson, M.J., Tasker, R, Ashkenazi, G, Williamson, K. (2005, July). Video demonstrations and particulate animations: Predications and reasoning. Poster presented at the 2005 Gordon Research Conference on chemical education research and practice. Connecticut College, CN.

Williamson, V.M. (2005, April). Developing inquiry laboratories. Paper presented at the 53rd National Conference of the National Science Teacher Association. Dallas, TX.

Williamson, V.M., Brown, L (2005, April). Facilitators and Barriers to Teacher Implementation of Molecular Visualization. Paper presented at the 53rd National Conference of the National Science Teacher Association. Dallas, TX.

Williamson, V.M., Brown, L. (2005, March). Effects of college chemistry course on freshman student's drawings of chemists". Paper presented at the 229th National Meeting of the American Chemical Society. San Diego, CA.

Williamson, V.M., Beckstead, B., Brown, L., Jose, T., & Simpson, M. (2004, November). Molecular visualization in the chemistry classroom. Workshop presented at the Conference for the Advancement of Science Teaching for the Science Teachers Association of Texas. Corpus Christi, TX.

Williamson, V.M. & Rowan, B. (2004, Oct.). Electronic homework in the undergraduate chemistry classroom. Paper presented at the Southwest Regional Meeting of the American Chemical Society. Dallas, TX.

Talkmitt, M. & Williamson, V.M. (2004, Oct.). Too hot to handle. Paper presented at the Southwest Regional Meeting of the American Chemical Society. Dallas, TX

Beckstead, B. & Williamson, V.M. (2004, Oct.). Students' perceived benefits of learning chemistry from a conceptually-based approach. Paper presented at the Southwest Regional Meeting of the American Chemical Society. Dallas, TX

Williamson, V.M. (2004, Oct.). The use of video and molecular animations to induce conceptual change. Paper presented at the Southwest Regional Meeting of the American Chemical Society. Dallas, TX.

Lindsay, L. & Williamson, V.M. (2004, Oct.). Teaching assistant attitudes and concerns relevant to a laboratory innovation implementation. Paper presented at the Southwest Regional Meeting of the American Chemical Society. Dallas, TX.

Williamson, V.M., Jose, T., & Simpson, M (2004, Oct.). Creating the collective. Paper presented at the Southwest Regional Meeting of the American Chemical Society. Dallas, TX.

Williamson, V.M., Lindsey, L., & Mealey, G. (2004, August). TA training for inquiry-based laboratories. Paper presented at the 228th National Meeting of the American Chemical Society. Philadelphia, PA.

Williamson, V.M., & Mealey, G. (2004, July). Evaluation of teaching assistant training for an inquiry-based general chemistry laboratory. Paper presented at the18th Biennial Conference on Chemical Education. Ames, IA.

Lindsey, L. & Williamson, V.M. (2004, July). Teaching assistant attitudes and concerns relevant to a laboratory innovation implementation. Paper presented at the18th Biennial Conference on Chemical Education. Ames, IA.

Jose, T., Restivo, E. & Williamson, V.M. (2004, July). Measurement of student attitude and understanding in the chemistry classroom: Investigation of the solubility of ionic compounds using molecular visualization. Paper presented at the18th Biennial Conference on Chemical Education. Ames, IA.

Jose, T. & Williamson, V.M. (2004, July). The effects of an intensive course on molecular visualization on teachers' content knowledge, spatial ability, and attitude. Paper presented at the18th Biennial Conference on Chemical Education. Ames, IA.

Williamson, V.M. (2004, March). Effects of molecular visualization training on teachers' attitudes, content knowledge, and spatial ability. Paper presented at the 227th National Meeting of the American Chemical Society. Anaheim, CA.

Williamson, V.M., Ashkenazi, G. & Tasker, R. (2003, July). Visualization to promote conceptual change. Paper presented at the 2003 Gordon Research Conference on visualization in science and education. Oxford, UK.

Williamson, V.M., McKee, E., & Peck, L. (2003, March). Use of a demonstration laboratory in teaching chemistry. Paper presented at the 225th National Meeting of the American Chemical Society. New Orleans, LA.

Williamson, V.M., Brown, L., & Peck, L. (2003, March). Facilitators and barriers to teacher implementation of molecular visualizations. Paper presented at the 225th National Meeting of the American Chemical Society. New Orleans, LA.

Williamson, V.M. (2003, March). Inquiry-based laboratory manuals. Paper presented at the 225th National Meeting of the American Chemical Society. New Orleans, LA.

Jose, T.J., Restivo, E., & Williamson, V.M. (2003, March). Measurement of student attitude and understanding inn the chemistry classroom: Investigation of the solubility of ionic compounds using molecular visualization. Paper presented at the 225th National Meeting of the American Chemical Society. New Orleans, LA.

Pasos, J., Williamson, V.M, Peck, L, & Williamson, K.C. (2003, March). Comparison of achievement in the use of static, dynamic, and interactive visualization tools. Paper presented at the 225th National Meeting of the American Chemical Society. New Orleans, LA.

Williamson, V.M. & Jose, T. (2003, Feb.) Using the OWL electronic homework system. A paper at the 57th Annual Convention of the Texas Community College Teachers Association.

Williamson, V.M. (2002, July). Moving towards inquiry laboratories. Paper at the17th Biennial Conference on Chemical Education. Bellingham, WA.

Williamson, V.M.& Williamson, K.C. (2002, July). Effects of explicitness on mental model building. Paper at the17th Biennial Conference on Chemical Education. Bellingham, WA.

Williamson, V.M. (2002, July). The effects of a molecular visualization workshop for high school teachers. Paper presented at the17th Biennial Conference on Chemical Education. Bellingham, WA.

Williamson, V.M., Pasos, J., Lindsay, L., Jose, T., Brown, L., & Brode, D. (2002, July). Paper set: Molecular Visualization Five papers presented at the17th Biennial Conference on Chemical Education. Bellingham, WA.

Brown, L., Williamson, V.M., & Peck, M.L. (2002, July). Facilitators and barriers to teacher implementation of molecular visualization. Paper presented at the17th Biennial Conference on Chemical Education. Bellingham, WA.

Pasos, J., & Williamson, V.M. (2002, July). Comparison of achievement in interactive vs dynamics vs static learning approaches. Paper presented at the17th Biennial Conference on Chemical Education. Bellingham, WA.

Jose, T.J., & Williamson, V.M. (2002, July). Changes in attitude and behavior of participants at a workshop on molecular visualization. Paper presented at the17th Biennial Conference on Chemical Education. Bellingham, WA.

Brode, D.L. & Williamson, V.M. (2002, July). Images of scientists. Paper presented at the17th Biennial Conference on Chemical Education. Bellingham, WA.

Walker, D.R., Williamson, V.M., & Yenello, S. (2000, April). Web-based Introductory Chemistry Module: A Field-Test. Referred paper presented at the 73rd Annual Conference of the National Association for Research in Science Teaching. New Orleans, LA.

Williamson, V.M. (2002, April). The effects of a molecular visualization workshop for high school teachers. Paper presented at the 223rd National Meeting of the American Chemical Society. Orlando, FL.

Huffman, J., & Williamson, V.M. (2002, April). Testing students' use of particulate terms. Paper presented at the 223rd National Meeting of the American Chemical Society. Orlando, FL.

Jose, T.J., & Williamson, V.M. (2002, April). Changes in attitude and behavior of participants at a workshop on molecular visualization. Paper presented at the 223rd National Meeting of the American Chemical Society. Orlando, FL.

Jose, T.J., Williamson, V.M, & Peck, M.L. (2002, April). Use of molecular visualization in the classroom: a review of the literature. Paper presented at the 223rd National Meeting of the American Chemical Society. Orlando, FL.

Lindsay, L.L., Williamson, V.M, & Peck, M.L. (2002, April). Evolution of chemistry curriculum. Paper presented at the 223rd National Meeting of the American Chemical Society. Orlando, FL.

Brode, D.L. & Williamson, V.M. (2002, April). Drawing scientists: A literature survey. Paper presented at the 223rd National Meeting of the American Chemical Society. Orlando, FL.

Williamson, V.M., Peck, M.L., & Jose, T.J. (2002, January). Molecular visualization on-line module. Poster presented at the Regents' Initiative for Excellence in Education Texas A&M University Collaborative Research Conference, College Station, TX.

Williamson, V.M. (2001, Oct.). Chemical education courses from Texas A & M University. Paper presented at the Southwest Regional Meeting of the American Chemical Society. San Antonio, TX.

Williamson, V.M. & Pasos, J, Lindsay, L, Jose, T, & Brode, D. (2001, Oct.). Paper set: Molecular Visualization; Four papers presented at the Southwest Regional Meeting of the American Chemical Society. San Antonio, TX.

Williamson, V.M. (2001, August). New pedagogies for teaching large lecture classes at Texas A&M University. Paper presented at the 222nd National Meeting of the American Chemical Society. Chicago, IL.

Jose, T.J. & Williamson, V.M. (2001, August). Evaluation of the NSF workshop on molecular Visualization in Science Education. Poster presented at the 222nd National Meeting of the American Chemical Society. Chicago, IL.

Williamson, V.M. & Jose, T.J. (2001, August). Evaluation of the NSF workshop on molecular Visualization in Science Education. Poster presented at the 2001 Gordon Research Conference on science education and visualization. Mount Holyoke College, South Hadley, MA.

Mason, D., Williamson, V.M., & Walker, D.R. (2001, March). Master-level programs in chemical education. Paper presented at the 221st National Meeting of the American Chemical Society. San Diego, CA.

Williamson, V.M. (2001, March). Changes in freshman chemistry: A move towards inquiry-based laboratories. American Association of Colleges for Teacher Education 53rd Annual Meeting. Dallas, TX.

Williamson, V.M. (2000, August). Group problem solving vs. lecture in college-level quantitative analysis. 16th Biennial Conference on Chemical Education. Ann Arbor, MI.

Williamson, V.M. (2000, April). Group problem solving vs. lecture in college level quantitative analysis. Interactive poster session presented at the 73rd Annual Conference of the National Association for Research in Science Teaching. New Orleans, LA.

Walker, D.R., Williamson, V.M., & Yenello, S. (1999, August). Web-based introductory chemistry module: A Field-Test. Paper presented at the 218th National Meeting of the American Chemical Society. New Orleans, LA.

Williamson, V.M., & Cracolice, M.S. (1998, August). Computer animation, mental modeling, and

algorithmic - conceptual equilibrium problem solving of college chemistry students. Paper presented at the 15th Biennial Conference on Chemical Education. Waterloo, ON, CA.

Williamson, V.M. (1998, April). Year three of a science research/education experience for teachers. Referred paper presented at the 71st Annual Conference of the National Association for Research in Science Teaching. San Diego, CA.

Williamson, V.M. (1997, April). The effect of a research/education experience on teachers' attitudes towards science and process skills. Referred paper presented at the 70th Annual Conference of the National Association for Research in Science Teaching. Oakbrook, IL.

Williamson, V.M. (1996, November). Teaching chemistry conceptually. Paper presented at the 96th Annual Convention of the School Science and Mathematics Association. Little Rock, AR.

Williamson, V.M., & et al. (all teacher participants from Eisenhower grant) (1996, October). Natural science learning cycles for grades 2-3; 4-5; and 6-8. Three presentations at the Annual Meeting of the Illinois Science Teachers Association. Chicago, IL.

Williamson, V.M. (1996, October). Teaching chemistry conceptually. Paper presented at the Annual Convention of the Illinois Science Teachers Association. Chicago, IL.

Williamson, V.M., & Jones, M.A. (1996, August). Peer assisted project for enhancing elementary science. Paper presented at the 14th Biennial Conference on Chemical Education. Clemson, SC.

Williamson, V.M., & Jones, M.A. (1996, August). Peer assisted project for enhancing elementary science. Paper presented at the 4th Biennial Conference on Chemical Education. Clemson, SC.

Williamson, V.M., & Abraham, M.A. (1996, August). Computer animation and the understanding and misconceptions of college chemistry Students. Paper presented at the 14th Biennial Conference on Chemical Education. Clemson, SC.

Williamson, V.M., & Cracolice, M.S. (1996, May). Mental modeling, computer animation, and problem solving with general chemistry students. Paper presented at the 29th Annual Great Lakes Regional Meeting of the American Chemical Society. Normal, IL.

Williamson, V.M., & Jones, M.A. (1996, May). Peer assisted project for enhancing elementary science. Paper presented at the 29th Annual Great Lakes Regional Meeting of the American Chemical Society. Normal, IL.

Williamson, V.M., & Cracolice, M.S. (1996, April). Computer animation, mental modeling, and algorithmic and conceptual equilibrium problem solving of college chemistry students. Referred paper presented at the 69th Annual Conference of the National Association for Research in Science Teaching. St. Louis, MO.

Williamson, V.M., Cracolice, M.S., Poelker, B., Rogers, L.N., Westbrook, S.L. (1996, March) Learning Cycles, Hands-on, and the National Standards: Are there differences? A panel presentation at the 1996 National Convention of the National Science Teachers Association at St. Louis, MO.

Williamson, V.M., & et al. (all teacher participants from scientific literacy grant) (1995, September). Natural science learning cycles for grades 2-3; 4-5; and 6-8. Three presentations at the Annual Meeting of the Illinois Science Teachers Association. Springfield, IL.

Williamson, V.M. (1995, September). The learning cycle, integration, and the national standards. Paper presentation at the Annual Meeting of the Illinois Science Teachers Association. Springfield, IL.

Williamson, V.M., & Cracolice, M.S. (1995, August). The effects of computer animation on the algorithmic and conceptual equilibrium problem solving of college chemistry students. Paper presented at the 210th National Meeting of the American Chemical Society. Chicago, IL.

Williamson, V.M., & Williamson, K.C. (1995, April). The effects of verbal explicitness on college chemistry students' mental model building. Paper presented at the 68th Annual Conference of the National Association for Research in Science Teaching. San Francisco, CA.

Fisher, R.L., Williamson, V.M., Penick, J.E., Westbrook, S.L., & Wright, E.L. (1995, April). Integrated learning: Can it, should it, be done. Symposium presented at the 68th Annual Conference of the National Association for Research in Science Teaching. San Francisco, CA.

Williamson, V.M., & Cracolice, M.S. (1994, November). Physical science in the elementary school: How do we overcome the obstacles. Workshop presented at the Regional Convention of the

National Science Teachers Association. Minneapolis, MN.

Jones, M.A., Weldon, S.L., Baur, M., Williamson, V.M., Goldberg, K., & Deluca, J. (1994, August). Expanding your horizons-What chemists can do to participate in this conference for middle school girls in math and science. Paper presented at the at the 208th National Meeting of the American Chemical Society. Washington, D.C.

Williamson, V.M., & Fisher, R.L. (1994, April). Formative evaluation of an integrated mathematics, science, and technology (IMaST) program for seventh grade. Referred paper presented at the 67th Annual Conference of the National Association for Research in Science Teaching. Anaheim, CA.

Cracolice, M.S., & Williamson, V.M. (1994, April). Hands-on is not enough: Using the learning cycle to teach elementary science. Paper presented at the 42nd National Convention of the National Science Teachers Association. Anaheim, CA.

Williamson, V.M., & Cracolice, M.S. (1994, April). Making hands-on elementary science more effective: Transforming traditional science into learning-cycle science. Workshop presented at the 42nd National Convention of the National Science Teachers Association. Anaheim, CA.

Williamson, V.M., Westbrook, S.L., Fisher, R.L., & Rogers, L.N. (1994, April). Integrating science with mathematics and technology. Panel presentation at the 42nd National Convention of the National Science Teachers Association. Anaheim, CA.

Williamson, V.M., & Abraham, M.R. (1993, April). The effects of computer animation on the algorithmic and conceptual equilibrium problem solving of college chemistry students. Paper presented at the 66th Annual Conference of the National Association for Research in Science Teaching. Atlanta, GA.

Williamson, V.M., & Cracolice, M.S. (1993, April). Physical science: Alive and well in elementary school. Workshop presented at the 41st National Convention of the National Science Teachers Association. Kansas City, MO. Cracolice, M.S., & Williamson, V.M. (1992, October). The one computer classroom: Using a Macintosh in a science classroom even if you have no computer experience. Paper presented at the Joint NSTA and CAST-92 Convention. Fort Worth, TX.

Williamson, V.M., & Abraham, M.R. (1992, March) The effects of computer animation emphasizing the particulate nature of matter on the understandings and misconceptions of college chemistry students. Paper presented at the 65th Annual Conference of the National Association for Research in Science Teaching. Boston, MA.

Williamson, V.M., & Cracolice, M.S. (1992, February). The development and use of computer animations in general chemistry. Paper presented at the 36th Pentasectional Meeting of the Oklahoma American Chemical Society. Bartlesville, OK.

Williamson, V.M., Abraham, M.R., & Westbrook, S.L. (1991, April). A cross-age study of five chemistry concepts, Paper presented at the 64th Annual Conference of the National Association for Research in Science Teaching. Lake Geneva, WI.

Williamson, V.M. (1990). A cross-age study of five chemistry concepts. Poster Session Competition, Graduate Student Recognition Day, Univ of Okla.

Williamson, V.M. (1977, Spring). Analysis of teaching methods. Paper presented to visiting teachers at the High School Visitation Day, Department of Chemistry and Biochemistry, University of Oklahoma.

IMaST Presentations:

Over 45 presentations of the Integrated Mathematics, Science, and Technology program focusing on development, integration, constructivism, national science standards, and assessment at regional and national meetings of the National Science Teachers Association, at national meetings of School Science and Mathematics Association, at science teacher meetings in various states, and at workshops and meetings of various groups. (June 1993-August 1997) The top 25 are listed below:

At National Science Teacher Association Meetings:

Williamson, V.M. (1996, November). The Learning Cycle, Integration, and the National Standards. Paper presented at the Area Convention of the National Science Teachers Association. Toronto, CA.

Williamson, V.M. (1996, November). Methodologies of inquiry teaching in exploration, discussion, and application/expansion. Paper presented at the Area Convention of the National Science Teachers Association. Atlanta, GA.

Williamson, V.M. (1996, October). Assessment in learning cycle classrooms. Paper presented at the Area Convention of the National Science Teachers Association. Phoenix, AR.

Williamson, V.M. (1995, December). Assessment of integrated learning. Paper presented at the Area Convention of the National Science Teachers Association. San Antonio, TX.

Williamson, V.M., & Fisher, R.L. (1995, November). Integrated learning and assessment. Paper presented at the Area Convention of the National Science Teachers Association. Baltimore, MD.

Williamson, V.M. (1995, March). Integrating science with mathematics and technology. Paper presented at the 43rd National Convention of the National Science Teachers Association. Philadelphia, PA.

Williamson, V.M. (1994, November). Science in a real context. Workshop presented at the Regional Convention of the National Science Teachers Association. Minneapolis, MN.

At School Science and Mathematics Association Meetings:

Williamson, V.M. (1996, November). Integration with mathematics, science, and technology? IMaST. Workshop presented at the 96rd Annual Convention of the School Science and Mathematics Association. Little Rock, AR.

Shook, S.A., & Williamson, V.M. (1995, November). Assessment for integrated mathematics, science, and technology. Workshop presented at the 95th Annual Convention of the School Science and Mathematics Association. Williamsburg, VA.

Williamson, V.M., & Shook, S.A. (1995, November). IMaST: Integrating mathematics, science, and technology. Two hour workshop presented at the 95th Annual Convention of the School Science and Mathematics Association. Williamsburg, VA.

Williamson, V.M., & Fisher, R.L. (1994, October). How can integration between mathematics, science, and technology take place? IMaST! Two-hour workshop presented at the 94th Annual Convention of the School Science and Mathematics Association. Fresno, CA.

Williamson, V.M., & Fisher, R.L. (1994, October). IMaST: Integrating mathematics, science, and technology. 1/2 day workshop presented at the 94th Annual Convention of the School Science and Mathematics Association. Fresno, CA.

Williamson, V.M. (1993, October). IMaST: Integrating mathematics, science, and technology. Poster presented at the 93rd Annual Convention of the School Science and Mathematics Association. Alexandria, LA.

At Illinois Science Teacher Association Meetings:

Williamson, V.M., & Fisher, R.L. (1993, October). Integrated mathematics, science, and technology. Two hour workshop presented at the Annual Convention of the Illinois Science Teachers Association. Collinsville, IL.

Williamson, V.M. (1996, October). The learning cycles, integration, and the National Standards. Workshop presented at the Annual Convention of the Illinois Science Teachers Association. Chicago, IL.

At Other Teacher Meetings:

Williamson, V.M., Shea, T.A., Shook, S.A., & Hovde, R.L. (1997, February 7) Folwell School, Minneapolis, MN.

Williamson, V.M., Shea, T.A., Shook, S.A., & Hovde, R.L. (1995, December) One Day IMaST Intro

Workshop, Normal, IL.

Williamson, V.M., Shea, T.A., Shook, S.A., & Hovde, R.L. (1995, August) Five Day Design Team Workshop, Normal IL

Williamson, V.M. (1995, May). The learning cycle and science standards. Presentation at a project Connect meeting. Normal, IL.

Williamson, V.M., Shea, T.A., Shook, S.A., & Hovde, R.L. (1994). IMaST. Presentation at the Phi Delta Kappa meeting. Normal, IL

Williamson, V.M., Shea, T.A., Shook, S.A., & Hovde, R.L. (1994, August) Five Day Teacher Workshop, Field Test, L.C., Normal, IL.

Williamson, V.M., Shea, T.A., Shook, S.A., & Hovde, R.L. (1994, June-July) Four Week Design Team Workshop, Normal, IL.

Williamson, V.M., Shea, T.A., Shook, S.A., & Hovde, R.L. (1994, May) Pilot Test Teacher Debrief, L.C., Waste Management, Normal, IL.

Williamson, V.M., Shea, T.A., Shook, S.A., & Hovde, R.L. (1993, August) Two Day Teacher Workshop, Normal, IL.

Williamson, V.M., Shea, T.A., Shook, S.A., & Hovde, R.L. (1993, June-July) Five Week Design Team Workshop, Normal, IL.

GRADUATE COMMITTEES

College of Science

Member for **Will Cameron Boyles**, Statistics Doctoral Degree, Texas A & M University (2020- present).

Co-Chair, Research Advisor for **Sean Carroll**, Chemical Education Masters Degree, Texas A & M University (2008-2010). " Computer Experimentation: An investigation into the instructions for the IR Tutor program".

Co-Chair, Research Advisor for **Rebecca Rich**, Chemical Education Masters Degree, Texas A & M University (2007-2008). “Attitudes toward Chemistry: The Characteristics of Chemophobia”.

Co-Chair, Research Advisor for **James Watkins**, Chemical Education Masters Degree, Texas A & M University (2005-2008). “Changes in Students’ Spatial Ability, Equilibrium Content Knowledge, and Attitudes Through the Use of Storyboards and Student-Constructed Animation in College General Chemistry”.

Member for **Ron Henriquez**, Chemistry Doctorial Degree, Texas A & M University (2004-2007).

Co-Chair, Research Advisor for **Travis Gilbreath**, Chemical Education Masters Degree, Texas A & M University (2005-2007). “The Effect of Macroscopic and Particulate Visualizations on Students' Particulate Explanations”.

Co-Chair, Research Advisor for **Tara Sarvela**, Chemical Education Masters Degree, Texas A & M University (2005-2007). “Feedback and Attitude Study of Online Web-Based Learning (OWL) in First Semester General Chemistry”.

Co-Chair, Research Advisor for **Sara Tate**, Chemical Education Masters Degree, Texas A & M University (2005-2006). “Historical Analysis of Student Performance in Junior Level Chemistry Courses”.

Co-Chair, Research Advisor for **Suparna Chatterjee**, Chemical Education Masters Degree, Texas A & M University (2004-2006). “Students’ Perception and Attitudes towards Guided and Open Inquiry Laboratories”.

Co-Chair, Research Advisor for **Tracy Harrison Fulton**, Chemical Education Masters Degree, Texas A & M University (2002-2006). “Investigating Students’ Attitudes Toward Organic Chemistry.”

Member for **Letticia Espinosa**, Chemistry Doctorial Degree, Texas A & M University (2003-2006).

Co-Chair, Research Advisor for **Mary Simpson**, Chemical Education Masters Degree, Texas A & M University (2002-2005). “Changes in Explanations of the Nature of Matter using Videos and Animations.”

Co-chair, Research Advisor for **Sean McMaughan**, Chemical Education Masters Degree, Texas A & M University (2002-2005). “Knowledge of Historical Background Compared to Understanding of

the Structure of the Atom."

Co-chair, Research Advisor for, **Brittany Beckstead** Chemical Education Masters Degree, Texas A & M University (2002-2004), "Student Attitudes towards Learning Conceptual Quantitative Analysis."

Co-chair, Research Advisor for **Brooke Rowan**, Chemical Education Masters Degree, Texas A & M University (2002-2004), "Electronic Homework in the Undergraduate Chemistry Classroom."

Co-chair, Research Advisor for **Lorraine Lindsay**, Chemical Education Masters Degree, Texas A & M University (2001-2003). "Teaching Assistant Attitudes and Concerns Relevant to a Laboratory Innovation Implementation."

Co-chair, Research Advisor for **Gina Mealey**, Chemical Education Masters Degree, Texas A & M University (2002-2003), "Evaluation of Teaching Assistant Training."

Co-chair, Research Advisor for **Erik McKee**, Chemical Education Masters Degree, Texas A & M University (2001-2003). "Effects of a Demonstration Laboratory on Student Learning."

Co-chair, Research Advisor for **Lisa Brown**, Chemical Education Masters Degree, Texas A & M University (1999-2003). "Facilitators And Barriers To Teacher Implementation Of Molecular Visualization."

Co-chair, Research Advisor for **Crista Force**, Chemical Education Masters Degree, Texas A & M University (2002-2003). "Effects of Science Laboratory on Students' Attitudes in Science."

Co-chair, Research Advisor for **Alexandria Velaquez**, Chemical Education Masters Degree, Texas A & M University (2001-2002). "The Use of Video Demonstrations and Particulate Animation Assessments in the Chemistry Classroom".

Co-chair, Research Advisor for **Julie Pasos**, Chemical Education Masters Degree, Texas A & M University (2001-2002). "Comparison of Achievement in the Use of Static, Dynamic & Interactive Visualization Tools"

Co-chair, Research Advisor for **Thomas Jose**, Chemical Education Masters Degree, Texas A & M University (2001-2002), "The Attitudes and Behaviors of Participants of an Interdisciplinary Workshop on Molecular Visualization."

Co-chair, Research Advisor for **Denise Brode**, Chemical Education Masters Degree, Texas A & M University (2001-2002). "Images of Scientists: Affects of Caregivers."

Co-chair, Research Advisor for **Mary Ellen Passarelli**, Chemical Education Masters Degree, Texas A & M University (2000-2001). "Retention of Chemistry Majors at Texas A&M University."

Member for **Bonnie Louradis**, Chemical Education Masters Degree, Texas A & M University (2000-2001). "UV Analysis of Sunscreens: An Introductory Organic Laboratory Experiment Incorporating a Real World Sample."

Member for **Sam Cozzens**, Chemical Education Masters Degree, Texas A & M University (2000-2001). "Development and Implementation of a Supramolecular Experiment for Chemistry 433 - Advanced Inorganic Laboratory."

Co-chair, Research Advisor for **Jason Huffman**, Chemical Education Masters Degree, Texas A & M University (1999-2001). "Testing Students' Use of the Particulate Theory."

Co-chair, Research Supervisor for **Erich Santos**, Chemical Education Masters Degree, Texas A & M University (1997-1999). "Enjoyment of Group Work vs. Lecture in Laboratory Recitation."

Co-chair, Research Advisor for **Deborah Walker**, Chemical Education Masters Degree, Texas A & M University (1998-1999). "Web-Based Introductory Chemical Module: A Field Study."

College of Education

Member for **Cathy Martinez**, Masters Degree, Department of Teaching Learning & Culture. Texas A & M University (2004- present).

Member for **Shelley Alexander**, Ph.D. Degree, Department of Teaching Learning & Culture. Texas A & M University (2002- present).

Member for **Judy Hudek**, Masters Degree, Department of Teaching Learning & Culture. Texas A & M University (2007- 2009).

Member for **Deena Harper**, Ph.D. Degree, Department of Teaching Learning & Culture, Texas A & M

University (2002-2008).
Member for **Pamela Rogers**, Ph.D. Degree, Department of Teaching Learning & Culture. Texas A & M University (2002- 2006).
Member for **Joowon Huh**, Masters Degree, Department of Educational Technology, Texas A & M University (2003-2004).
Member for **Jisook Kim**, Masters Degree, Department of Teaching Learning & Culture, Texas A & M University (2003-2004).
Member for **Laura Aaron**, Masters Degree, Department of Teaching Learning & Culture, Texas A & M University (2003-2004).
Member for **Dane Bozman**, Masters Degree, Department of Teaching Learning & Culture, Texas A & M University (2003-2004).
Member for **Melinda Ledwig**, Masters Degree, Department of Teaching Learning & Culture, Texas A & M University (2003-2004).
Member for **Evelyn Restivo**, Masters Degree, Department of Teaching Learning & Culture, Texas A & M University (2000-2001).

College of Architecture
Member for **Andrew J. Anderson**, Masters Degree, Department of Construction Science. Texas A & M University, focus on reasoning abilities of students and the effect on grades (2016- 2017).

College of Medicine
Member for **Jarred R. Howard**, Masters Degree, Interdepartmental. Texas A & M University, focus on education for healthcare professionals (2020- present).

UNDERGRADUATE CHEMICAL EDUCATION RESEARCH MENTORING
36 students in 1 or more semesters (14 for multiple semesters), Fall 2010 to present.

NATIONAL/REGIONAL SERVICE
Editorial:
Editorial Board Member, *Journal for Science Education and Technology*, 2004 to present
Reviewer for the *Journal of Chemical Education*, 1998 to present
Reviewer for *Chemistry Education Research and Practice*, 2017-present.
Associate Editor, *School Science and Mathematics Journal*, 2006 to 2011
Feature Editor for the Chemical Education Research section of the *Journal of Chemical Education*, 2002 to 2010
Reviewer for the *Chemical Educator,* 2007 to 2010

Conference Committees:
Exhibits Chair, Biennial Conference on Chemical Education, August 2010, the University of North Texas, 2006 to 2010.
Exhibits Chair, Chemed 07 held Summer 2007 at the University of North Texas (Chemed is an international meeting held on the odd years for high school and college instructors of chemistry.)

Panels and Committees:
ACS Ambassador: 2013 to present. Working with community and schools to make chemistry more accessible and pointing out the links between chemistry and daily life.
OWL Lead Teacher: 2005 to present. Provides support to instructors nationwide using the On-line Web Learning (OWL) homework.
ACS Division of Chemical Education Biennial Conference Committee Member: Appointed January 2012-December 2020. This committee seeks institutions to host the BCCE meeting and works with those institutions in planning and conducting the conference, which is attended by chemical

education researchers and chemistry instructors at both the high school and college levels.

Committee Member: American Chemical Society E. Ann Nalley Southwest Region Award for Volunteer Service, October 1-10, 2016.

NSF Review Panelist for the SLCN proposals, June 2016

ACS Chemical Education Research Committee Chair: Appointed Chair January 2011-December 2013. This committee promotes chemical education research, including the distribution of guidelines for good research practice, the delivery of chemical education research workshops, etc.

ACS Chemical Education Research Committee Member: Appointed for a three-year term as member, January 2009 to December 2011. This committee promotes chemical education research, including the distribution of guidelines for good research practice, the delivery of workshops on chemical education research, etc.

Candidate: for ACS Division of Chemical Education Chair Elect, 2009 election

ACS Division of Chemical Education Task Force on Division Outreach Chair: This five-member task force made recommendations concerning future outreach by the division, 2009

Candidate: ACS Division of Chemical Education Chair Elect, 2008 election.

Candidate: ACS Division of Chemical Education Examinations Institute Board of Trustees, 2007 election.

ACS 2008 General Chemistry Conceptual Exam Chair: 2006 to 2008. This committee authored a standardized examination containing conceptual questions. This exam is available from the ACS Exams Institute for use worldwide.

Committee Member, Endowment Committee, School Science and Mathematics Association: 2004 to 2007.

ACS 2007 General Chemistry Paired Question Exam Committee Member: 2004 to 2006. This committee authored a standardized examination that contains both algorithmic and conceptual questions for first and second semester general chemistry. It is available for international use.

NSF Review Panelist for the CCLI proposals, Summer 2005, 2006

NSF Review Panelist for the SVIR/STTR proposals, Fall 2003

ACS Chemical Education Research Committee Member: Appointed for two three-year terms, January 2000 to December 2005. This committee promotes chemical education research, including the distribution of guidelines for good research practice, the delivery of workshops on chemical education research, etc.

ACS 2001 General Chemistry Conceptual Exam Committee Member: March 1999 to 2001. This committee authored a standardized examination offered by the ACS Division of Chemical Education Examinations Institute. The 2001 American Chemical Society examination in general conceptual chemistry was available for use worldwide and included author's names and institutions.

Symposia:

Symposium Organizer: Williamson, V.M. (2018, August). One-pot Synthesis for Student Success in General Chemistry. Full day symposium at the 25th Biennial Conference on Chemical Education. Notre Dame, South Bend, IN

Symposium Organizer: Mason, D, Shelton, R.G., Suits, J. & Williamson, V.M. (2016, July) Research in Chemical Education. Four-day symposium at the 24th Biennial Conference on Chemical Education. Greeley, CO.

Symposium Organizer: Schatzberg, W. & Williamson, V.M. (2014, March) Research in Chemical Education. 2-day symposium at the 247th National Meeting of the American Chemical Society. Dallas, TX.

Symposium Organizer: Grove, N., Shorb, J., & Williamson, V.M. (2013, April) Peer-Reviewed Symposium in Chemical Education Research. 245th National Meeting of the American Chemical Society. New Orleans, LA.

Symposium Organizer: Bunce, D., Herrington, D., Vanden Plas , J., & Williamson, V.M. (2012,

August) Peer-Reviewed Symposium in Chemical Education Research. 22nd Biennial Conference on Chemical Education. State College, PA.

Symposium Organizer: Williamson, V.M. (2011, August) Personal Response Systems in the Classroom: Clicking Our Way to More Learning? 242nd National Meeting of the American Chemical Society. Denver, CO.

Symposium Organizer: Williamson, V.M., Bunce, D. & Pazini, S. (2011, March) Peer-Reviewed Symposium in Chemical Education Research. 241st National Meeting of the American Chemical Society. Anaheim, CA.

Symposium Organizer: Williamson, V.M. (2010, March). ACS Award for Achievement in Research for the Teaching and Learning of chemistry: symposium in Honor of Michael R. Abraham at the 239th National Meeting of the American Chemical Society. San Francisco, CA.

Symposium Moderator: Williamson, V.M. (July, 2009). P-16 Alignment in the Texas. College and Career Readiness Symposium, Dallas, TX.

Symposium Organizer: Williamson, V.M.& Mason, D. (2006, September). Research in Chemical Education. 2.5-day symposia organized at the 232nd National Meeting of the American Chemical Society. San Francisco, CA.

Symposium Organizer: Williamson, V.M.& Jose, T. (2006, March) Using Particulate Visualization in General Chemistry Classes. Half-day symposium organized at the 231st National Meeting of the American Chemical Society. Atlanta, GA.

Symposium Organizer: Williamson, V.M.& Mason, D. (2003, March). Research in Chemical Education. 2.5-day symposium organized at the 225th National Meeting of the American Chemical Society. New Orleans, LA.

Symposium Organizer: Williamson, V.M. (2002, July). Using Molecular Visualization in General Chemistry Classes. Symposia organized at the17th Biennial Conference on Chemical Education. Bellingham, WA.

Symposium Organizer: (2001, Oct.). Williamson, V.M. Graduate Education for Chemistry Teachers Symposia organized at the Southwest Regional Meeting of the American Chemical Society. San Antonio, TX.

Symposium Organizer: Williamson, V.M. (2000, August). Validating Distance Education Instruction With Research. Symposia organized at the 16th Biennial Conference on Chemical Education. Ann Arbor, MI.

STATE, UNIVERSITY AND COMMUNITY SERVICE

Director, Region V, Associated Chemistry Teachers of Texas: 2006 to present. This advisory position works with the state chemistry teachers' organization to help both new and experienced teachers of chemistry at all levels from elementary to college.

On-Line Web Learning homework (OWL) administrator for general chemistry courses, Texas A&M, 2001-Spring 2020, most 119, 120, and 107 courses. For Fall 2020 for 120 and 107 courses.

Faculty Advisor: Aggie KCAM (Knitting, Crafts and More), This service organization provides handmade items to nursing homes, hospitals, and those in need. Organized fall 2010 to fall 2020.

Host Classroom, Aggie Recruitment Committee, TAMU, 2011 to present. This program allows high school students to visit college lectures during the fall and spring semester. From 10-30 students visit my classes each semester.

Host Classroom, Visit of Society of Women Engineers (SWE) High School Conference, 2011-present.

Instructor for Chemistry Merit Badge: This included planning, procuring materials, and organizing helpers to work with almost 100 boy scouts. TAMU Merit Badge University, Feb. 23, 2019.

Member, TAMU Student Success Taskforce: May 2018-March 2019. Provost initiative to improve student success and retention.

Member, First Year Experience Subcommittee of the TAMU Student Success Taskforce: August – September 2018. To make recommendations for a unified first year experience for all incoming first time students.

Committee Member, College-level Teaching Award Committee, Spring 2018.
Mentor: College of Science to two incoming, freshman majors, Fall 2017.
Committee Member, Chemistry Department Chair Search Committee, Spring 2016.
Faculty Mentor for Xuan Wang, Academy of Future Faculty, Center for Teaching Excellence, fall 2015-spring 2016.
Committee Member, Provost ad-hoc Committee for Education Grand Challenge: Summer 2015.
Committee Member, Association of Former Students Award Committee, 2015.
Host, New Families Welcome, New Student Programs, TAMU, October 2010. This program allows families of new students to visit lectures.
Host, Visit of AP classes from A&M Consolidated High School, College Station, TX, October 2010.
Member, Texas A&M Dean of Faculties Search Committee, 2009.
Organizer: Departmental New Graduate Student training, which included: Texas A&M University Chemistry course organization, questioning/tutoring techniques, students with disabilities, classroom management, safety, eye protection, inquiry techniques, etc. Sessions were delivered by a number of faculty members. Fall 1998-2006, 2009
Organizer: Chemistry Demonstration Show for 'Scouting Out A&M', a program for girl scouts ages 6-18, March 28th, 2009
Organizer: Chemistry Education Journal Club/Chemical Education Interest Group, Texas A&M University. Organized meetings of this group of instructors to explore current articles on the teaching/learning of chemistry to help student understanding of chemistry, Fall 1999-Spring 2009.
Editor: Chemistry 101/102 Demonstration Manual for Texas A&M University, including authoring some demonstrations and adding safety danger level and concepts developed to all demonstrations, Jan. 2008
Member, Texas A&M Reagents' Initiative, Academy for Educator Development-First Induction, 2000- 2006 when it was dissolved.
Committee Member, Chemical Education Committee, Department of Chemistry, Texas A&M University, 1997-2004.
Organizer/Coordinator Departmental Chemistry 101-102 TA semester-long lab training for inquiry-based laboratories partial implementation Fall 1999-Spring 2001 and full implementation Fall 2001-Spring 2006.
Volunteer, Texas A&M University Chemistry Open House**,** October 2005.
Troop Committee Member, Boy Scouts of America. 1987- 2004.
Speaker for Chemistry Review, Leaders in Freshman Engineering, Texas A&M University, May, 2004.
Volunteer, Texas A&M University Chemistry Open House**,** October 2003.
Academic Faculty Advisor: Squadron 16, Corps of Cadets, Texas A&M University August 2001 to August 2003.
Committee Member, Committee on Education, College of Science, Texas A&M University, 1997-2003.
Speaker, How to succeed in College, Department of Biochemistry graduate students, Texas A&M University, August 2002.
Faculty Advisor: Aggie School Volunteers, organized Feb 1999 to September 2001. This service organization works in conjunction with area elementary schools to provide tutors to work individually with elementary students.
Committee Member, Science NCATE Team, College of Science, Texas A & M University, 2000-2001.
Group Chair: Chemical Education Interest Group, Department of Chemistry, Texas A & M University, 1999-2001.
Session Organizer, Expanding Your Horizons, Texas A&M University 1994-2000.
Field Trip Organizer: Conference for the Advancement of Science Teaching, the annual conference for the Science Teachers' Association of Texas, Texas A&M University October 2000.
Organizer/Recruiter: Texas A&M University Chemistry Department's Annual High School Chemistry Teacher Appreciation Day. Saturday workshop to acquaint teachers with the department and its

outreach program. Included sessions, make-&-take workshops, Internet training and lunch. 1998-2000.

Tournament Judge: Oklahoma Junior Academy of Science, Norman, OK, 1993
Committee Member: Science Education Search committee; University of Oklahoma, 1989-90.
Science Fair judge; Norman, Oklahoma area public schools, 1987-1993

PROFESSIONAL MEMBERSHIPS
American Chemical Society (ACS) Chemical Education Division Member
Association of Chemistry Teachers of Texas (ACT2)
National Science Teacher Association (NSTA)
Phi Delta Kappa (education)
Pi Mu Epsilon (honorary mathematics)
Alpha Chi (general scholarship)

CURRICULUM DEVELOPMENT PROJECTS
Inquiry Lab Manual for college general chemistry, Author
Inquiry Lab Manual for college non-majors chemistry, Author
Chemfile Interactive Tutor, HOLT CD for high school chemistry, Script Author
Integrated Mathematics, Science, and Technology (IMaST) for 7th and 8th grades
Hands-On Physical Science Laboratories For Upper Elementary School (Cracolice, M. & Williamson, V.M) 1993. Unpublished.
Computer Animations Depicting The Particulate Nature Of Matter For Beginning Chemistry Courses

TAMU COURSE DEVELOPMENT PROJECTS
Taught from 1990-2006

CHEM 698: Inquiry & Chemistry Concepts --This graduate level course is for inservice teachers or for graduate students whose committees approve. The course investigates the essential concepts in chemistry at the precollege level and the methods and techniques of inquiry teaching as called for by state and national standards. Parallels between inquiry teaching and scientific inquiry are drawn. The course is a combination of two on-campus visits and Web-based activities.

CHEM 696: Modern Applications in Chemistry --This graduate level course is for inservice teachers or for graduate students whose committees approve. The course focuses on modern topics in chemistry and their application in the precollege classroom in a manner compatible with good scientific inquiry. The course has variable content and credit hours. Previous topics have centered on molecular visualization as applied to the high school or general chemistry classroom, on material science, and on industrial chemistry, its importance to society, the role of radioactivity, kinetics and catalysis, organic synthesis (production of drugs and polymers), and patents. A field trip to a chemical manufacturing plant highlighted these areas of study. Another version of the course focused on molecular visualization and its infusion into the classroom. The course involves four Saturday on-campus visits (one per month) and Web-based activities or a short, intensive session during the summer with Web-based activities before and after the summer session.

COURSES TAUGHT (TAMU Courses in bold)
Undergraduate:

- •Introduction to Chemistry for Nursing Majors Laboratory,
- •Chemistry and Society Lecture (i.e., consumer chemistry),
- •Fundamentals of Chemistry Lecture/Laboratory (one semester survey),
- **•Molecular Science for Citizens Laboratory (one semester survey),**
- **•First Semester General Chemistry Lecture/Laboratory (for science & related majors),**
- **•First Semester General Chemistry Lecture (for science & related majors),**

•First Semester General Chemistry Laboratory (for science & related majors),
•Second Semester General Chemistry Lecture/Laboratory (for science & related majors),
•Second Semester General Chemistry Lecture (for science & related majors),
•Second Semester General Chemistry Laboratory (for science & related majors).
•Secondary Science Methods
•Directed Studies

Graduate:

•Modern Applications of Chemistry-Materials Science
•Modern Applications of Chemistry-Industrial Chemistry
•Modern Applications of Chemistry-Molecular Visualization
•Inquiry & Chemistry Concepts
•Issues in Chemical Education
•Directed Studies
•Chemical Education Seminar
•Professional Internship Project
•Methods of Teaching Chemistry Laboratory
•Secondary Science Methods