

CURRICULUM VITA

RICHARD A. DUSCHL
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ACADEMIC BACKGROUND

| <i>Degree</i> | <i>Institution</i> | <i>Year</i> | <i>Program</i> |
|---------------|-----------------------------------------------------|-------------|----------------------------|
| Ph.D. | University of Maryland College Park, Maryland | 1983 | Science Education |
| M.A.T. | Michigan State University East Lansing, Michigan | 1980 | Geology |
| B.S. | University of Maryland College Park | 1974 | Earth Science Education |

Certifications

State of Maryland Teaching Certificate - Earth Science & General Science

Informal Science Study Trainer (National Diffusion Network Program)

SAVI/SELPH Leadership Workshop, University of Houston-Clear Lake Campus, November 12-15, 1984 (Science activities for visually impaired and physically handicapped students)

GLOBE (Global Learning and Observation to Benefit the Environment) Trainer Workshop, Middle Tennessee State University. 1998. (Web-based science inquiry learning environment).

PROFESSIONAL EXPERIENCE

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| 2008 – present | Waterbury Chair in Secondary Education, Professor of Science Education, College of Education, Penn State University |
| 2004 to 2008 | Professor of Science Education, GSE Rutgers Center for Cognitive Sciences, Executive Committee |
| 1999 - 2004 | Chair of Science Education, King's College London |
| 1995 - 1999 | Professor of Science Education, Vanderbilt University |
| 1991 - 2004 | Series Editor - Ways of Knowing Science - Teachers' College Press, Columbia University |
| 1992 - 2001 | Editor, <i>Science Education</i> , John Wiley & Sons Publisher |
| 1991 - 1995 | Associate Professor with tenure, University of Pittsburgh |
| 1991 - 1992 | Curator for Science Exhibits - Children's Museum of Houston, Houston, Texas |
| 1989 - 1991 | Assistant Professor, University of Pittsburgh |
| 1987 - 1989 | Associate Professor (Non-tenured), Hunter College of CUNY |
| 1983 - 1987 | Assistant Professor, University of Houston-Univ. Pk. |
| 1986 - 1987 | Coordinator Science Education Programs, The Children's Museum of Houston. |
| 1981 - 1983 | Graduate Research Assistant, Dean's Office, College of Education, University of Maryland-College Park. |
| 1978 - 1981 | Teaching Assistant, Department of Geology, University of Maryland-College Park |
| 1979 - 1983 | Intern, Maryland State Department of Education, Baltimore. |
| 1976 - 1978 | Teacher, McDonough HS, Charles County Board of Education, LaPlata, MD |

PROFESSIONAL ACTIVITIES

A. Publications

1. Books/Reports

Duschl, R. & Grandy, R. (Eds.) (2008) *Teaching Scientific Inquiry: Recommendations for Research and Implementation*. Rotterdam, Netherlands: Sense Publishers.

Duschl, R., Schweingruber, H., & Shouse, A., (Eds.), (2007). *Taking Science to School: Learning and Teaching Science in Grades K-8*. Washington, DC : National Academies Press.

Duschl, R. (1997). *Renovar La Enseñanza de las Ciencias*. (Spanish Translation *Restructuring Science Education: The Importance of Theories and Their Development* by Victor Alvarez Perez y M.Pilar Jimenez Aleixandre) Madrid: Narcea, S.A. De Ediciones.

- Duschl, R. (1990). *Restructuring Science Education: The Importance of Theories and Their Development*. New York: Teacher's College Press.
- Duschl, R. & Hamilton, R. (Eds.) (1993). *Philosophy of Science, Cognitive Psychology, and Educational Theory and Practice*. Albany, NY: SUNY Press.
- Osborne, J. F., Duschl, R., & Fairbrother, R. (2002). *Breaking the Mould: Teaching Science for Public Understanding*. Nuffield Foundation. Available: <http://www.kcl.ac.uk/education/hpages/jopubs.html>.
- Harrison, C., Black, P., Osborne, J. & Duschl, R. (2004). *Assessment of Science Learning 14-19: A report to the Royal Society*. London: Royal Society.

2. Chapters in edited books

- Duschl, R. (2008). Science education in 3 part harmony: Balancing conceptual, epistemic and social learning goals. In J. Green, A. Luke, & G. Kelly, Eds, *Review of Research in Education, V32*. (pp.268-291) Washington, DC: AERA.
- Duschl, R. (2007). Quality argumentation and epistemic criteria. In S. Erduran & M. Jimenez-Aleixandre, Eds. *Argumentation in Science Education: Perspectives from classroom-based research*. Dordrecht Netherlands: Springer.
- Duschl, R. (2005), Using and Abusing: Relating History of Science to Learning and Teaching Science, In L. Flick & N. Lederman, Eds., *Scientific inquiry and Nature of Science: Implications for teaching, learning and teacher education*. Dordrecht, The Netherlands: Kluwer Academic Press.
- Duschl, R. (2003). The Assessment of Argumentation & Explanation: Creating and Supporting Teachers' Feedback Strategies. In D. Zeidler, Ed., *The Role of Moral Reasoning on Socio-Scientific Issues and Discourse in Science Education*. Dordrecht, The Netherlands: Kluwer Academic Press.
- Duschl, R. (2003) Assessment of Inquiry. In M. Atkin & J. Coffey Eds., *Everyday Assessment in Science Classrooms*. Washington, DC: NSTA Press.
- Duschl, R. (2002). Making scientific thinking visible: The role of evidence diversity and theory articulation. In T. Koschmann, R. Hall & N. Miyake (Eds.) *CSSL 2: Carrying Forward the Conversation*. Mahwah, NJ: Erlbaum Publishers. pp 487-492.
- Duschl, R. (2000). Making the nature of science explicit. In R. Millar, J. Leech & J. Osborne (Eds.) *Improving Science Education: The contribution of research*, Philadelphia: Open University Press. pp 187-206.
- Duschl, R. (1994). Research on the History and Philosophy of Science. In D. Gable, Ed., *Handbook of Research in Science Teaching*. New York: Macmillan. pp. 443-65.
- Duschl, R. (1993). "An Inquiry into the plausibility of competing explanations about earthquakes." In K. Kachman & C. Sutton, (Eds.) *Curriculum reform in college science: Applying historical cases of theory change*. Monograph prepared for Radford Conference, Radford College, VA.
- Duschl, R. (1988). Improving science teacher education programs through the inclusion of history and philosophy of science. In J. Barufaldi, (Ed.), *1987 Association of Educators of Teachers of Science Yearbook*, pp. 1-24. Columbus, OH: ERIC Clearinghouse for Science, Mathematics and Environmental Education.

- Duschl, R. (1986) The changing concept of scientific observation. In R. Bybee (Ed.) *1985 NSTA Yearbook*, pp. 16-22. Washington, DC: National Science Teachers Association.
- Duschl, R. (1985) Preservice science teacher education and history of science. In R. James (Ed.) *1985 AETS Yearbook*, pp. 16-22. Columbus, OH: ERIC Clearinghouse for Science, Mathematics and Environmental Education.
- Duschl, R. & Duncan, R. (2009). Beyond the Fringe: Building and Evaluating Scientific Knowledge Systems. In S. Tobian & T. Duffy (Eds.). *Constructivist theory applied to instruction: Success or failure?* (pp. 312-332). London: Taylor & Francis.
- Duschl, R. & Erduran, S. (1996). Modelling the growth of scientific knowledge. In G. Welford, J. Osborne, & P. Scott (Eds.) *Research in Science Education in Europe: Current Issues and Themes*. London: Falmer Press. Pp 153-165.
- Duschl, R. & Feather, R. (1996). Developing and nurturing objectivity in science classrooms. In F. Finley, et al (Eds.), *Third International Conference History, Philosophy of Science and Science Teaching*, Minneapolis, MN October 29 - November 1, 1996. Minneapolis: University of Minneapolis.
- Duschl, R. & Grandy, R. (2008). Reconsidering the character and role of inquiry in school science: Framing the debates. In R. Duschl & R. Grandy, Eds., *Teaching Scientific Inquiry: Recommendations for Research and Implementation*. Rotterdam, Netherlands: Sense Publishers.
- Duschl, R. & Hamilton, R. (1998). Conceptual Change in Science and in the Learning of Science. In B. Fraser and K. Tobin, (Eds.), *International Handbook of Science Education*. Dordrecht: Kluwer Academic Publishers. Pp 1047-1065.
- Duschl, R. & Hamilton, R. (1993) Introduction - Viewing the Domain of Science Education. In R. Duschl & R. Hamilton (Eds.), *Philosophy of Science, Cognitive Psychology, and Educational Theory and Practice*. Albany, NY: SUNY Press
- Duschl, R., Hamilton, R., & Grandy, R. (1993). Tension issues between epistemological and psychology frameworks in Science Education. In R. Duschl & R. Hamilton (Eds.), *Philosophy of Science, Cognitive Psychology, and Educational Theory and Practice*. Albany, NY: SUNY Press.
- Duschl, R. & Smith, M. (2001). Earth Science. In J. Brophy (Ed.) *Subject –Specific Instructional Methods and Activities; Advances in Research on Teaching, V 8*. Oxford: Elsevier Science Ltd. pp. 269-290.
- Duschl, R. & Waxman, H.C. (1991). Impacting the Learning Environments of Student Teaching: Investigations with Preservice Teachers. In B. Fraser and H. Walberg, (Eds.), *The Study of Learning Environments*, pp. 255-270. London: Pergamon Press.
- Gitomer, D. & Duschl, R. (2007). Establishing multi-level coherence in assessment. In P. Moss (Ed.). *Evidence and decision making, NSSE 2007 Yearbook*, V106, Issue 1.
- Gitomer, D. & Duschl, R. (1998). Emerging Issues and Practices in Science Assessment. In B. Fraser and K. Tobin, (Eds.), *International Handbook of Science Education*. Dordrecht: Kluwer Academic Publishers. Pp 791-810.

- Gitomer, D. & Duschl, R. (1995). "Portfolio Culture Science". In S. Glynn & R. Duit, (Eds.), *Applying science education research to the classroom*. Hillsdale, NJ: Erlbaum Press.
- Goldman, S., Duschl, R., Ellenbogen, K., Williams, S. & Tzou, C. (2003). Science inquiry in a digital age: Possibilities for Making Thinking Visible. In H. van Oostendorp (Ed.) *Cognition in a Digital Age*. Mahwah, NJ: Erlbaum Publishers.
- Grandy, R. & Duschl, R. (2008). Consensus: Expanding scientific method and school science. In R. Duschl & R. Grandy, Eds., *Teaching Scientific Inquiry: Recommendations for Research and Implementation*. Rotterdam, Netherlands: Sense Publishers.
- Waxman, H. & Duschl, R. (1987). Using student perception data to assess teaching effectiveness of student teachers. In B. Fraser (Ed.) *The Study of Learning Environments, Vol.2*, pp. 72-79. Perth: Curtin University of Technology.

3. Articles (* indicated referred journals)

- * Duschl, R. (2002). New Drivers for New Science Education Highways. *Canadian Journal of Science, Mathematics and Technology Education*, 2(2), 219-224.
- *Duschl, R. (2001). Earth System Science: A better way to each science enquiry. *Teaching Earth Science*, 26(3), 89-93.
- *Duschl, R. A. (1998) La valoracion de argumentaciones y explicaciones: Promover estrategias de retroalimentacion. [Designing curriculum and assessments that establish and nurture argumentation, explanation and modelling] *Ensenanza De Las Ciencias*, 16(1), 3-20.
- *Duschl, R. (1995). Beyond cognition: The epistemic and social challenges of conceptual change teaching. *Ensenanza de las Ciencias*, 13(1), 3-14.
- Duschl, R. (1990). Teaching of theory as a concept in science education. Commissioned paper to Biological Science Curriculum Study as part of NSF Grant "History and Nature of Science and Technology in Science and Social Studies."
- * Duschl, R. (1989). Comments on "Analyzing hierarchical relationships among modes of cognitive reasoning and integrated process skills". *Journal of Research in Science Teaching*, 26(5), 381-384.
- * Duschl, R. (1988). Abandoning the scientific legacy of science education. *Science Education*, 72(1), 51-62.
- * Duschl, R. (1987). Causes of Earthquakes: Inquiry into the plausibility of competing explanations. *Science Activities*, 24(3), 8-14.
- Duschl, R. (1987). Planning triads for effective sequencing of instructional tasks. *The Texas Science Teacher*, 16(4), 15-19.
- Duschl, R. (1987). Extended abstract and analysis of "Laboratory teaching skills for secondary science teachers coming to grips with the problems of Laboratory Instruction. *Investigations in Science Education*, 13(1), pp. 9-17.
- * Duschl, R. (1986). Textbooks and the teaching of fluid inquiry. *School Science and Mathematics*, 86(1), 27-32.
- * Duschl, R. (1986). New science curricula and philosophy of science. *The Education Digest*, March, 40-43. [Reprint of *School Science and Mathematics*, 85(7) article see below].

- * Duschl, R. (1985). Teaching data process skill using wood blocks. *Science Activities*, 22(4), 26-29.
- Duschl, R. (1985). Putting scientific theories and fact into a proper perspective in science courses. *The Texas Science Teacher*, 14(4), 11-15.
- * Duschl, R. (1985). Science education and philosophy of science: Twenty-five years of mutually exclusive development. *School Science and Mathematics*, 85(7), 541-555.
- Duschl, R. (1985). Extended abstract and analysis of "Using the science classroom learning environment for improving instruction." *Investigations in Science Education*. 11(1), 32-43.
- * Duschl, R. (1983) The elementary-level science methods course: Breeding grounds for an apprehension toward science? *Journal of Research in Science Teaching*, 20(8), 745-754.
- * Duschl, R. (1983) Equal-time requests: Implication for teachers and science curricula. *School Science and Mathematics*, 83(4), 299-306.
- * Duschl, R. (1983). Comments on "An analysis of prospective science teachers' understanding of the nature of science." *Journal of Research in Science Teaching*, 20(4), 373-374.
- Duschl, R. (1983). Science, religion just don't mix. Opinion-Editorial. *Houston Chronicle*, November 23, p.15.
- *Duschl, R. & Ellenbogen, K. (in press). Argumentation and Epistemic Criteria: Investigating Learners' Reasons for Reasons. *Educacion Quimica*.
- *Duschl, R. & Gitomer, D. (1997). Strategies and challenges to changing the focus of assessment and instruction in science classrooms. *Educational Assessment*, 4, (1), 37-73.
- *Duschl, R. & Gitomer, D. (1991). Epistemological Perspectives on Conceptual Change: Implications for Educational Practice. *Journal of Research in Science Teaching*, 28(9), 839-858.
- Duschl, R. & Grandy, R.: 2005, 'Reconsidering the Character and Role of Inquiry in School Science: Framing the Debates', *NSF Inquiry Conference Proceedings*, <http://www.ruf.rice.edu/~rgrandy/NSFConSched.html>.
- *Duschl, R. & Osborne, J. (2002). Argumentation and Discourse Processes in Science Education. *Studies in Science Education*, 38. 39-72.
- *Duschl, R. & Wright, E. (1989). A Case Study of High School Teachers' Decision Making Models for Planning and Teaching Science. *Journal of Research in Science Teaching*, 26(6), 467-501. [Received JRST Award for Most Significant Contribution to Volume 26].
- *Duschl, R., Hamilton, R. & Grandy, R. (1990). Psychology and epistemology: Match or mismatch when applied to science education? *International Journal of Science Education*, 12(3), 230-243.
- * Duschl, R.A., Deak, G.O., Ellenbogen, K.M. & Holton, D.L. (1999) Developmental and educational perspectives on theory change: To have and hold, or to have and hone? *Science & Education*, 8, 525-541.
- *Erduran, S. & Duschl, R. (2004). Interdisciplinary characterizations of models and the natural chemical knowledge in the classroom. *Studies in Science Education*, 40, 111-144.

- *Grandy, R. & Duschl, R. (2007). Reconsidering the Character and Role of Inquiry in School Science: Analysis of a Conference. *Science & Education*, 16(1).
- *Lythcott, J. & Duschl, R. (1990). Qualitative research: From method to conclusions. *Science Education*, 74, 445-460
- *Jimnez-Aleixandre, M.P., Rodrigues, A. B., & Duschl, R.A. (2000) "Doing the lesson" or "doing science": Argument in high school genetics. *Science Education*, 84(6), 757-792.
- *Ke, J.L., Monk, M. & Duschl, R. (2005). Learning introductory quantum mechanics: Sensori-motor experience and mental models. *International Journal of Science Education*. 27(13).
- Adams, K., Gitomer, D., & Duschl, R. (1995). Rethinking teaching through assessment in middle school science. *Science Scope*, 18(7), 18-21.
- Rosato, N., Gitomer, G. & Duschl, R. (1994). Showing understanding and revising ideas" Strategies for developing science portfolios. *Portfolio News*.
- Stone, M. & Duschl, R. (1987). Elementary level science inservice activities: An analysis and evaluation of a cumulative staff development program. *Southwest Journal of Education Research into Practice*, 1, 15-19.
- *Subotnik, R. & Duschl, R. (1993). Investigating the career choice of Westinghouse Science Talent Winners: A longitudinal study. *International Journal of Science Education*, 15(1), 61-72.
- *Osborne, J. F., Ratcliffe, M., Collins, S., Millar, R., & Duschl, R. (2003). What 'ideas-about-science' should be taught in school science? A Delphi Study of the 'Expert Community'. *Journal of Research in Science Teaching*, 40(7), 692-720. [JRST Award for outstanding paper of Vol 40].
- *Schauble, L., Glaser, R., Duschl, R. Schulze, S. & John, J. (1995). Students' understanding of the objectives and procedures of experimentation in the science classroom. *The Journal of the Learning Sciences*, 4(2), 131-166.

3. Curriculum Materials

EARTHCOMM (2001) Am. Geological Inst. High School Earth Science Systems Textbook, Contributed chapter to Unit on Dynamic Landscapes.

Science as Inquiry - A 90 minute Telecommunications Inservice Program. WQEX, Pittsburgh, PA.

Morrow, J., Pivarnik, J., Whitmore, J., Duschl, R. et al. (1987). Step for a Healthy Heart. Austin, TX: Texas Chapter of the American Heart Association.

Duschl, R. (1986). Texas Master Booklet for Earth Science. Columbus: OH: Charles E. Merrill Publishing Co.

4. Reviews of Books and Films

- Duschl, R. (2002). Review of "A personalized approach to science education " by Derek Hodson. *Science Education*, 86(5).
- _____. (1996). Review of "Science Teaching: The Role of History and Philosophy of Science" by M. Matthews. *Journal of Curriculum Studies*, 28, (2), 233-236.
- _____. (1988). Missing-Links. Bookwatch Reviews: Candid appraisals of science textbooks, 1(6), 2-3.
- _____. (1985). "Science and Unreason" by M. Radner. *Journal of Research in Science Teaching*. 22(5), 473-474.
- _____. (1983). Unknown Earth: A handbook of geological enigmas, NSTA Resource Review. *The Science Teacher*, 50(4).
- _____. (1981). Energy and everyday life; Sun, wind, and water; Energy from the Earth; Saving Energy; NSTA Resource Review. *The Science Teacher*, 50(4).
- _____. (1981). Learning about reptiles. NSTA Resource Review. *The Science Teacher*, 48(4).
- _____. (1981). Plate Tectonics. NSTA Resource Review. *The Science Teacher*, 48(4).
- _____. (1981). The advance of science: Underseas. NSTA Resource Review. *The Science Teacher*, 48(3).
- _____. (1980). Earth science: Exploring planet Earth, NSTA Resource Review. *The Science Teacher*, 47(8).
- _____. (1979). Limestone. NSTA Resource Review. *The Science Teacher*, 46(5).
- _____. (1979). Birds. NSTA Resource Review. *The Science Teacher*, 46(5).

B. Advocacy Efforts

Maryland House of Delegates, Committee on Constitutional and Administrative Law, invited testimony on House Bill 1078, "Equal-time request: Implications toward teachers and the curriculum", Annapolis, MD, 1981.

Maryland State Board of Education, invited testimony on the Science Framework Bylaw, Baltimore, MD, March 1983.

C. Presentations

1. International

"Data Texts" Invited poster presented at the biannual meeting of the European Association for Research on Learning and Instruction, Budapest, Hungary, August 29, 2007. with L. Avriamadou.

"Reconsidering the Character and Role of Inquiry in School Science: Analysis of a Conference " presentation at the International History and Philosophy of Science and Science Teaching Group conference, July 2005, Leeds, England with Richard Grandy, Rice University.

"Curriculum Frameworks for Linking Informal and Formal Science Education" talk presented as part of a Center for Informal Learning and Schools symposium at the annual meeting of ECSITE, November 2002, London, England.

Bridging Out-of-School and School Learning, presentation for the University of San Sebastian summer school "Los Museos de la Ciencia y la Alfabetización Científica en el Siglo XXI" (Science Museums and Scientific Literacy in the 21st Century). July 2002, San Sebastian, Spain.

"Models in Science Education" paper presented as part of a symposium at the International History and Philosophy of Science and Science Teaching Group conference November 2001, Denver, Colorado.

"Scaffolding and Assessing Argumentation Processes in Science Education" paper presented as part of a symposium at the biannual meeting of the European Association for Research on Learning and Instruction (EARLI) Friborg, Switzerland. September, 2001. With Kirsten Ellenbogen.

"Understanding dialogic argumentation among middle school students", paper presented as part of a symposium at the biannual meeting of the European Science Education Research Association (ESERA), August, 2001, Thessaloniki, Greece. With Kirsten Ellenbogen

"Assessing formative dimensions of scientific argumentation". Paper presented at the biannual meeting of the European Assoc. for Research on Learning and Instruction (EARLI) SIG – Assessment in Education, Maastricht, Netherlands, Sept. 13-15, 2000. With Kirsten Ellenbogen

Using and Abusing: Relating History of Science to Learning and Teaching Science
Invited paper for presentation at the British Society for the History of Science (BSHS)/Royal Society conference on "Science Communication, Education and the History of Science", 12-13 July 2000. London, England

"Tracking Data in Model-Based Science", Invited paper presented at the Museu de la Ciència Seminar, April, 2000, Barcelona, Spain.

"The Assessment of Argumentation & Explanation: Creating and Supporting Teachers' Feedback Strategies". Invited keynote address at the V Congreso Internacional sobre Investigación En Las Didácticas De Las Ciencias Y De Las Matemáticas, Universidad Autónoma de Murcia, Spain. September, 1997.

"Modelling the growth of scientific knowledge." Invited paper presented as a part of the symposium "Developing and understanding models in science education" Science Education Research in Europe - Leeds Conference, April 7-11, 1995.

"Beyond cognition: The epistemic and social challenges of conceptual change teaching." Invited keynote address at the IV Congreso Internacional sobre. Investigacion En Las Didactica De Las Ciencias Y De Las Mathematicas, Universidad Autonoma de Barcelona, Spain. September 16, 1993.

"Diagnosing students' conceptions using portfolio teaching strategies: The case of flotation and buoyancy." Invited paper presented at the 3rd International Seminar on Misconceptions and Educational Strategies in Science and Mathematics, Cornell University, August 1-4, 1993.

"Psychology and epistemology - Match or mismatch when applied to science education" with R. Hamilton and R. Grandy. Invited plenary session presentation at the International Conference on the History and Philosophy of Science in Science Teaching. Florida State University, November 6-11, 1989.

2. National

"Inquiry and the Learning of Science – Theories and Practices." Invited symposium presented at annual meeting of NARST, New Orleans, April, 2007. (with Nancy Brickhouse, Univ Delaware; Phil Bell, Univ Washington; Fouad Ab-El-Khalick, Univ. Illinois).

"Taking Science to School – National Research Council Report." Invited symposium presented at annual meeting of AERA, Chicago, April, 2007. (with Jean Moon, Nat'l Academies; Leona Schauble, Vanderbilt U.; Tom Corcoran, U of Penn).

"Taking Science to School – National Research Council Report." Invited symposium presented at annual meeting of NARST, New Orleans, April, 2007. (with Andrew Shouse, Nat'l Acad.; Brian Reiser, Northwestern U.; Jonathan Osborne, King's College London).

"Taking Science to School – National Research Council Report." Invited symposium presented at annual meeting of NSTA, St. Louis, March, 2007. (with Andrew Shouse, Nat'l Acad.; Dan Levin, Montgomery Co. Public Schools).

"Demarcation in Science Education: Toward an Enhanced View of Scientific Method" Paper presented as part of the invited symposium "Examination of the Evolution vs. Intelligent Design controversy: Opportunities for Epistemology and Philosophy of Science Education" at the annual meeting of AERA, April 2006, San Francisco.

"Inquiry and the Learning of Science – Theories and Practices", Chair/organizer of invited symposium at the annual meeting of AERA, April 2006, San Francisco; with Richard Grandy, Leona Schauble, Joseph Kracjik, William Sandoval & Drew Gitomer.

"Aligning nature of science and inquiry learning and teaching." Keynote address to the SIG Science Education at the annual meeting of AERA April 2005, Montreal.

“Argumentation in Science Education” invited paper at the annual meeting of AERA, April 12-16, 2004, San Diego.

“Continuous Professional Development for Science Teachers” Invited symposium at the annual meeting of AERA, April 12-16, 2004, San Diego

"Locating Science Learning" paper presented at part of a Center for Informal Learning and Schools (CILS) symposium at the annual meeting of the Association of Science & Technology Centers, Charlotte, NC. October 2002.

"Toward a research agenda for epistemological studies in science education" invited paper presented at the annual meeting of National Association for Research in Science Teaching (NARST), April, 2002. New Orleans, LA. With Greg Kelly

"Scaffolding and Assessing Argumentation Processes in Science" invited paper presented as part of a symposium at the annual meeting of National Association for Research in Science Teaching (NARST), April, 2002. New Orleans, LA. With Kirsten Ellenbogen

"Juxtaposing epistemic reasoning between small group and computer guided discourse learning environments". Paper presented to at the annual meeting of the American Educational Research Association, Seattle, April, 2001. With Kirsten Ellenbogen

"Making Explicit What we Know and How we Know: Nurturing and Assessing Epistemic Reasoning". Paper presented as part of a symposium at the annual meeting of the American Educational Research Association, Seattle, April, 2001. With Kirsten Ellenbogen

“Project SEPIA Design Principles” paper presented as part of structured poster symposium “Design Experiments in Children’s Science Education” at the annual meeting of AERA, New York, 1996, with Drew Gitomer.

“Using Portfolios to Assess Students' Conceptual Understanding of Flotation and Buoyancy.” Poster presented at the annual meeting of AERA, San Francisco, CA, April, 1995.

“Discourse analysis as a window into the classroom and into the minds of students.” Paper presented at the annual meeting of NARST, San Francisco, CA, March, 1995.

“Portfolio Culture Classrooms: Merging Scientific Thinking with Conceptual Learning.” Poster symposium presented at the annual meeting of AERA, San Francisco, CA, April, 1995.

"A review of M. Matthew's Science teaching: The role of history and philosophy of science." Paper presented at the annual meeting of the National Association for Research in Science Teaching, Anaheim, CA, March 29, 1994.

"The role of procedural knowledge in portfolio culture classrooms". Paper presented as part of a symposium on the annual meeting of the National Association for Research in Science Teaching, Anaheim, CA, March 28, 1994.

"History and Philosophy of Science and Science Teaching" an invited keynote address at the Biology in Action: New Approaches to Teaching and Learning Science conference, Radford University, Radford, VA; May 13-15, 1993.

"Theoretical bases for science education research." Paper presented as part of a symposium at the annual meeting of the National Association for Research in Science Teaching, Lake Geneva, WI, 1991.

"Teaching Chemistry: Strategic Clues from the Structure of Knowledge". Paper presented at the Biennial Chemical Education Conference, Atlanta, Aug. 9, 1990.

"Teaching of Theory: A Guiding Concept of Science Education". Paper presented at the annual meeting of the National Association for Research in Science Teaching, Atlanta, April 1990.

"Guiding Science Instruction: The Use of Historical Analysis," paper presented (as part of invited symposium "Can a Logic of Discovery Inform Strategic Knowledge), AERA, Boston, 1990.

"Investigating the career choices of the Westinghouse Science Talent Winners: A longitudinal study, " with Rena Subotnik & Eric Selmon. Invited paper presented at the annual meeting of American Education research Association (AERA), San Francisco, 1989.

"A Framework for applying history and philosophy of science to science education." Invited paper presented at the annual meeting of National Association for Research in Science Teaching (NARST), San Francisco, 1989.

"Double Indemnity: Students' separation of history and science," paper presented as part of an invited symposium titled "History of science, science, & science education: A report of anomalies on the teaching and learning of science" at the annual meeting of NARST, San Francisco, 1989.

Scientific theory as schema, an epistemological perspective," paper presented as part of an invited symposium titled "Conceptual crossroads: Scientific theories, cognitive schema and defining procedural knowledge" at the annual meeting of American Education Research Association (AERA), New Orleans, 1988.

"Investigating the relationship between students' perceptions of classroom instruction and effective science learning environments," with Hersholt Waxman. Invited paper presented at the annual meeting of AERA, New Orleans, 1988.

"Solution strategies for classification tasks by high school biology students," with Jeffrey Bloom. Invited paper presented at the annual meeting of AERA, Washington, D.C. 1987.

"Improving integrated process skill in preservice elementary teachers," with Terry Contant . Invited paper presented at the annual meeting of NARST, Washington, D.C. 1987.

"Focusing precollege science curricula: A discussion of five orientations." Organizer of invited symposium for presentation at the annual meeting of NARST, San Francisco, March 1986.

"Evaluating the teaching effectiveness of preservice teachers using pupils' feedback," with H. Waxman and R. Morecock. Invited paper presented at the annual meeting of NARST, San Francisco, March 1986.

"Directed teaching activities as inhibitors to implementation of science curriculum." Invited paper presented at the annual meeting of AERA, San Francisco, April 1986.

"A comparison of students', student teachers', cooperating teachers', and university supervisors' perceptions of classroom learning environments," with H. Waxman and R. Morecock. Invited paper presented at the annual meeting of AERA, San Francisco, April 1986.

"Improving science teacher education programs through inclusion of relevant research topics," presented as part of a symposium titled "Improving science teacher education through the inclusion of relevant research' at the annual meeting of AERA, Chicago, April 1985.

"Science education and philosophy of science: Twenty-five years of mutually exclusive development." Invited paper presented at the annual meeting of AERA, New Orleans, April 1984.

"Science teachers' beliefs about the nature of science and the selection, implementation, and development of instructional tasks." Invited paper presented at the annual meeting of NARST, New Orleans, April 1984.

"Reconsidering science curriculum necessitates a reconsideration of science teachers education" with C. Raymond Anderson. Invited paper presented at the annual meeting of the Association of Teacher Educators, New Orleans, April 1984.

"Reconsidering science curricula: Clues from the structure of scientific theories." Invited paper presented at the annual meeting of NARST, Dallas, April 1983.

"Elementary education science methods class: Breeding grounds for an apprehension toward science: An ethnographic study." Invited paper presented at the annual meeting of NARST Lake Geneva, April, 1992.

3. Regional

"Project SEPIA - Alternative assessment strategies in middle school science classrooms; Teachers perspectives" presented at the annual meeting of the Pennsylvania Science Teachers Association, PA Nov. 1993; with R. Karas, K. Adams, T. Golden, N. Rosato, & G. Tabone.

"Assessing the Learning Environment of Beginning Teachers". Presented at the meeting of Pennsylvania Educational Research Association, Pittsburgh, May 8, 1990.

"All things being equal doesn't apply to science content." Paper presented at an annual area meetings of the National Science Teachers Association & the Association for Educators of Teachers in Science. Atlantic City, Dec. 14, 1989.

"Teacher thinking and the planning of lessons on scientific theories." Invited paper presented at the annual meeting of the Northeast Educational Research Association (NERA), Ellenville, NY, November 2, 1988.

"Improving science teacher education programs through the inclusion of history and philosophy of science." Paper presented at the spring meeting of the AETS - Northeast Region, SUNY - Purchase May 6, 1988.

"Psychology and epistemology: Match or mismatch when applied to science education?" with Richard Hamilton and Richard Grandy. Invited paper presented at the annual meeting of Northeast Educational Research Association (NERA) Ellenville, NY, October 1987.

"Stop-light map interpretation." Invited workshop presented at the joint meeting of the National Science Teachers Association and Conference for the Advancement of Science Teaching, San Antonio, November 1987.

"Using students' feedback to improve teaching effectiveness of preservice science teachers," with H. Waxman and R. Morecock. Invited paper presented at the annual meeting of the Southwest Education Research Association, Houston, TX, January 1986.

"Assisting elementary level teachers with pupil task engagement during science lessons." Invited paper presented at the annual meeting of Southwest Association for Educators of Teachers in Science, Wichita, KS, October 1985.

"Putting scientific theories and facts into a proper perspective on science courses." Invited paper presented at the annual meeting of the Texas Academy of Science, Science Education section, Dallas, 1985.

"Closing the information gap among scientists and science teachers." Invited paper presented at the annual meeting of the Texas Academy of Science, Science Education section, San Antonio, 1984.

"Scientific knowledge or knowledge of science: The essential tension in the deliberation of precollege science curricula." Invited address for the Fall Colloquia of Scientia, Rice University, Houston, December 1984.

D. Grants

1. Funded

"Promoting Conceptual Change in Reasoning" Clark Chinn & Richard Duschl, National Science Foundation ROLE grant. 2005-2008. \$890,000; 2007 supplement award \$200,000.

"Establishing a Consensus Agenda for K-12 Science Inquiry" Richard Duschl & Richard Grandy, National Science Foundation conference grant. 2004-2006. \$91,000.

"King's College London/Weizmann Institute of Science Secondary Science Continuing Professional Development Project." With Jonathan Osborne, Bat-Sheva Eylon, Avi Hofstein. Gatsby Foundation. 2002-2005. \$500,000.

NSF Centers for Teaching and Learning - "Center for Informal Learning and Schools - CILS". Exploratorium, King's College London, UC-Santa Cruz. Rob Semper, Richard Duschl, Joyce Justice & Lynda Goff, Principal Investigators. National Science Foundation, \$10.8 million - 2001-2006.

"Tracking the Fate of Evidence and Ideas Among Collaborative Groups in Technology-Supported Assessment Contexts". NSF - Center for Innovation in Learning Technology (CILT). \$10,000 - 2000-2001. With Dan Hickey, University of Georgia

"Comparing whole class, small group and computer supported science discourse". NSF - Center for Innovation in Learning Technology (CILT). \$10,000 - 1998-1999. With Susan Goldman, University of Illinois, Chicago.

"National Center for Student Learning and Achievement in Mathematics and Science". Vanderbilt University Middle School Study Group, with Paul Cobb and Angelo Collins as part of the University of Wisconsin-Madison proposal - Tom Romberg, Principal Investigator. Office of Educational Research and Improvement, Department of Education. \$ 1,750,000.00 - 1996

"Portfolio Culture: An Alternative Assessment & Instructional Approach in Science."
NSF Materials Development and Informal Science Program - Research on Teaching and Learning. \$877,047.00 - 1991-1994. With Drew Gitomer, ETS

"African-American Recruitment Program" Department of Education. \$87,000.00 - 1990.

"An investigation of the knowledge bases and decision-making models used in beginner teacher's planning." Buhl grant, School of Education, University of Pittsburgh.
\$9,457.00 - 1990.

"A Study of the planning strategies and designs used by teachers with different conceptions of the nature of science." Faculty Research Opportunity Grant, University of Houston College of Education. \$340.00 - 1986.

Limited Grants-in-Aid; University of Houston. For presentation of research proposal to NSF, "Computer-enhanced reasoning in middle school science programs," with B. Foorman. \$800.00 - 1986.

"Teacher development program for middle school teachers of math and science."
Coordinating Board of Texas/Education for Economic Security Act. Co-Director with Jack Creswell. \$466,000.00 -1985.

E. Awards and Honors

Elected, President National Association for Research in Science Teaching (NARST)
2008-2011.

Distinguished Alumnus of the Year - College of Education, University of Maryland
Alumni Association, April, 2007.

Outstanding Scholar, College of Education Alumni Association, University of Maryland,
November, 2006.

National Academies – Chair of the “Science Learning Study K-8th Grades” committee.
2004 – 2007.

ReDiscover Advisory Board - Wellcome Trust panel to review and advise on distribution
of grants to UK science museums and science centers. 2003 to present.

Member, Advisory Board, Inquiry Addendum, National Standards Science Education,
National Research Council 1998-2000.

Distinguished Alumni, College of Education, University of Maryland, College Park.
1995.

Recipient of the 1989 JRST Award from the National Association for Research in Science Teaching. Awarded to the author of the manuscript judged the most outstanding contribution for Volume 26 of the Journal of Research in Science Teaching.

Appointed Fellow to Center for Philosophy of Science at the University of Pittsburgh. 1990-present.

Visiting lecturer for Education Community Forum Lecture Series at Faculty of Education Queen's University. January 26, 1988.

Appointed Visiting Fellow to Rice University's Scientia - Institute for the Study of the History of Science and Culture. 1990.

F. Service

1. Organizations - Membership and Involvement

- ~American Education Research Association (AERA)
 - Early Career Award Committee 2003-2005
 - Faculty Advisor - Division C Graduate Students Association 1999-2001.
 - Chair - Informal Learning SIG 2002 to 2004.
 - Program Chair - Subject Matter Knowledge and Conceptual Change SIG 1990 (Boston) and 1991 (Chicago).
 - Program Chair - The Study of Learning Environments SIG 1988 (new Orleans) meeting.
- ~Association for the Education of Teachers in Science (AETS)
 - Publication Committee 1986 - 1989
- ~European Science Education Research Association(ESERA)
 - Member
- ~European Association for Research on Learning and Instruction (EARLI)
 - Member
- ~History of Science Society
 - Member
 - Committee on Education , 2001-2004
- ~International History & Philosophy of Science, Science Teaching Group
 - Chair - Critical Issues Conference 2003-2005
 - Member
- ~National Assessment Governing Board
 - Member – Planning Committee, NAEP 2009 Science Framework
 - Member/writer – Issues Paper, NAEP 2009 Science Framework
- ~National Association for Research in Science Teaching (NARST)
 - Representative to Advisory Board for Investigations in Science ('83-'85);
 - JRST Awards Committee ('85-'88) & ('91-present).
 - Member - Executive Advisory Board 1992-1995;
 - Chair, Publications Committee, 1992-1995;
 - Elections Committee, 1998-2000.

Member - Distinguished Research Committee 2001-2006
Co-chair 2006; Chair 2006
President – 2008-2011
~Philosophy of Science Association
Member

2. Scholarly activities

~ 2008 – 2009 Advisor & Writer, State of New Jersey, Revision of Science Standards, Science Practices and Earth Science.
~ 2008 – 2009 Advisor & Writer, College Board, Learning Sciences Group; Revision of AP Exam – Environmental Sciences
~ 2009 – present Member Editorial Board *Cognition and Instruction*
~ 2009 – present Member Editorial Board *The Journal of the Learning Sciences*
~2006 to present Member Various NAEP 2009 Science Framework Committees
~ 2005 – 2007 Chair, National Academies Committee “Science Learning Study K-8”
~2003 to 2008, Associate Editor, *Cognition & Instruction*
~1991 to 2004, Series Editor, Ways of Knowing in Science, Teacher’s College Press.
~1992 to 2001- Editor - *Science Education*.
~ 2001 to present - Reviewer NSF ROLE Program; NSF CTL Program.
~Committee Member, National Academy of Sciences, Center for Science, Mathematics, and Engineering Education. Inquiry Addendum Committee - National Science Education Standards. 1997 to 1998.
~ Member Editorial Board, *Science & Education: An International Journal on History and Philosophy of Science and Mathematics and Teaching*.
~Advisory Board - Biological Science Curriculum Study and Social Science education Consortium on NSF Grant "The History and Nature of Science and Technology in Science and Social Studies."
~Consultant - Thames Science Center, New London, CT, NSF "Shoot for the Moon!"
~Reviewer for: *Journal of Research in Science Teaching*; *Science Education*; *Science & Education*; *American Education Research Journal*.
~Staff Writer - NRC - National Standards in Science Education.

G. Instruction and Advising (*course designed)

Teaching

Penn State University

Secondary Science Methods I

Rutgers, The State University of New Jersey

Science in the elementary schools

*Qualitative Research Methods - Classroom Discourse

*Topics in Science Education – Designing Inquiry Learning Environments

King's College London (1999- 2004)

*Conceptual Development and Science Learning
Intro to Quantitative Research Methods
Ph.D. & Ed.D tutorials and thesis supervision
Master's dissertation supervision
King's College London/Harrow LEA Science Teacher Education Inservice Programme

Vanderbilt University (1995-1999)

Secondary Science Methods Course
*History and Philosophy of Science & Teaching
Curriculum Foundations
Doctoral Student Seminar
*Argumentation Seminar
Freshman Writing Seminar - evolution and creationism/ Dept of Philosophy
Quantitative Research

University of Pittsburgh (1989-1995)

*Science Methods (I&L 2431)
*Intro to Science Education (I&L 2430)
Science Curriculum Development Analysis (I&L 3486)
Science Teaching Lab (I&L 2747)
Science Lab Workshop (I&L 2747)
Science Lab Workshop (I&L 2749)
History and Philosophy of Science Education (I&L 3485)
*Individualize Science Instruction & Learning (I&L 3487)

Hunter College (1987-1989)

Foundations of Science Lab Course (SCI 100/& 101)
Methods Teaching Secondary Science (EDUC 351 to 354)
Teaching Elementary Level Science (EDUC 726)
Methods Teaching Elementary Science (EDUC 335)

University of Houston (1983-1987)

Science Methods in the elementary school (ELED 4312)
Student Teaching - Science (SEDE 4392, 4391)
Science Instruction in the secondary school (SEDE 6324)
*Teaching Earth and Environmental Science (SEDE 6323)
Curriculum Development in Science Education (SEDE 7322)
Seminar Science Education (CUIN 7320)
*Geologic Analysis of Environmental Factors for Middle School Teachers (GEOL 4397)
*Structural Bases of Knowledge and Learning in Curriculum and Instruction (CUIN 7379)

2. Doctoral Advisees (*Present Position*)

Julie Monet – 2005 – Rutgers University
(Assistant Professor, UC-Chico)

Jiun-Ling Ke, - 2004 - King's College London

(Physics Teacher, Taiwan)
 Kirsten Ellenbogen - 2002, Vanderbilt University
 (Director of Research, Science Museum of Minnesota)
 Sibel Erduran - 1999, Vanderbilt University
 (Reader, University of Bristol UK)
 Mike Smith - 1995 - University of Pittsburgh
 (Former Director of Educational Programs, American Geological Institute)
 Terry Contant - 1987 - University of Houston
 (Associate Professor, Sam Houston State University)
 Jeffrey Bloom 1987 - University of Houston
 (Associate Professor, Arizona State University, Flagstaff)
 Marla Stone 1986 - University of Houston
 (Private Consultant)

UNIVERSITY AND COMMUNITY SERVICE

A. University and College

Penn State University

Member, Social Sciences Research Institute Advisory Board
 Co-Chair, College of Education P&T Committee
 Member, College of Education Faculty Council

Rutgers, The State University of New Jersey

President's Distinguished Service Research Award Committee
 President's Taskforce Undergraduate Curriculum Committee
 Oversight and Implementation Taskforce – Science Teacher Education

King's College London

2001-2004 Member, School Research Committee
 2001- 2004 Member Research and Development Committee, School of
 Social Science and Public Policy
 School of Education representative to KCL Enterprises
 2000- 2004 External examiner, Imperial College London, MS Science
 Communication Programme

Vanderbilt University

1996-1999 Member - Equal Access Committee
 1997-1999 University Library Adhoc Committee on Scholarly
 Publishing
 1996-1998 Provost's Adhoc University Research Taskforce
 1995-1997 Peabody College Faculty Affairs Committee

University of Pittsburgh

1991 Search Committee - APS Department; Philosophy of Education
 1991-1995 Promotion & Tenure Committee - Chair 93-95
 1991-1992 Member Steering Committee for Forum on Education
 Assessment Series. Co-chair Assessment in Teacher Education Program.
 1990-1992 Member College Human Subjects Committee.

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|---------------------------------------------|----------------|------------------------------------------------------------------------------------|
| | 1990-1992 | Coordinator. African-American Teacher Education Fellowship Program. |
| | 1990-1992 | Member Operations Committee - Pittsburgh School District University Collaboration. |
| Hunter College | | |
| | 1987-88 | Provost's Taskforce on Liberal Arts Education of Elementary Level Teachers |
| | 1987-88 | Committee on the Undergraduate Secondary Education Program |
| University of Houston | | |
| | 1986-87 | Library Committee |
| | 1986-87 | Ester Farfel Award Committee (Highest Faculty Award at UH) |
| | 1984-87 | Teacher Effectiveness Committee (Chair, 86-87) |
| | 1985-87 | Salary Review Committee College |
| | 1985 | College Taskforce on Preparation of Preservice Teachers |
| B. Department | | |
| Rutgers, The State University of New Jersey | | |
| | 2004 – present | Appointment & Promotion Committee |
| | 2004-2005 | Chair, Science Education Search Committee |
| King's College London | | |
| | 2001-2004 | Member Department Executive Committee |
| | 2001-2004 | Chair, Research and Development Committee |
| | 2000-2004 | Chair, EdD. Exam Board |
| Vanderbilt University | | |
| | 1997-1999 | Coordinator, Department Colloquium Series |
| University of Pittsburgh | | |
| | 1992-1994 | Coordinator, Math Science Education Program |
| | 1991-1992 | Search Committee - Special Education |
| | 1989-1992 | Personnel Committee |
| Hunter College | | |
| | 1988-1989 | Graduate Curriculum Committee |
| | 1988-1989 | Department Representative Faculty Senate |
| University of Houston | | |
| | 1986-87 | Mission Taskforce |
| | 1984-85 | Tenure and Promotion Committee |
| | 1983-85 | Undergraduate Studies Committee |