

**PROFESSION**

Professor of Mathematics Education: Semi-Retired

Fulbright Scholar 7 July 2011 – 6 June 2012

Host: Department of Science, Mathematics, and Technology Education, University of Pretoria, Pretoria 0002, South Africa

Focus: I am collaborating with UP colleagues in the design, development, deployment, and evaluation of a web-based *Geometry for Teachers* course addressing the needs of both pre-service and in-service secondary mathematics teachers in South Africa. A key element in this project is the development of instructional materials that promote the development of pedagogical content knowledge and that facilitate technology implementation. I am also training STEM education faculty in the use of research methodologies and technologies for dealing with massive amounts of unstructured data (e.g., institutional and governmental reports, journal articles and proceedings papers, and student writing samples) essential in the evaluation of programs and policies at the institutional and national levels.

**CURRENT ADDRESS**

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**EDUCATION BEYOND HIGH SCHOOL**

- Ed.D. Montana State University, Bozeman, Montana, 1983
- M.Ed. Walla Walla College, Walla Walla, Washington, 1977
- B.A. Wayne State University, Detroit, Michigan, 1968

**EXPERIENCE**

- 2009 – 2011. Semi-retired as a Mathematics Consultant, Great Falls Public Schools, Great Falls, MT
- 2007-2009. Director, Raggio Research Center for Science, Technology, Engineering, and Mathematics Education, University of Nevada, Reno
- 2002-2007. Associate and Full Professor of Mathematics Education, Department of Mathematics, University of Idaho
- 2000-2002. Associate Professor of Mathematics Education, Department of Mathematical Sciences, Ball State University (promoted to full just prior to leaving)
- 1986-2000. Assistant, Associate, and Full Professor of Mathematics Education, Department of Mathematical Sciences, Montana State University
- 1983-1986. Assistant Professor, Department of Education and Psychology Walla Walla College
- 1968-1981. High school mathematics, science, and electronics teacher

**TEACHING ACCOMPLISHMENTS****Areas of Specialization**

I am a mathematics educator specializing in instructional uses of computer-based modeling tools and WWW-based distance education technologies. Within that domain, I am most interested in modern geometry and its associated technologies.

**Courses Taught**

University of Nevada, Reno

- CTL 650 General Secondary Methods
- CTL 711 Technology in Society, Mathematics, and Science

University of Idaho

- Math 170 Analytic Geometry and Calculus I
- Math 235 Mathematics for Elementary Teachers I
- Math 236 Mathematics for Elementary Teachers II
- Math 391 Geometry

Ball State University

- MATHS 108 Intermediate Algebra
- MATHS 202 Geometry and Measurement in Grades K-6
- MATHS 331 Computer Applications in the Teaching of Mathematics
- MATHS 391 Teaching Mathematics in Early Childhood, Primary, and Intermediate Grades
- MATHS 395 Introduction to the Teaching of Mathematics
- MATHS 399 Classroom Use of Methods and Materials

Montana State University

- MATHS 130 and 131 Mathematics for Elementary Teachers
- MATHS 256 Foundations of Higher Mathematics
- MATHS 329 Modern Geometry
- MATHS 524 Linear Algebra for Teachers
- MATHS 527 Geometry for Teachers
- MATHS 533 Advanced Teaching Strategies in Mathematics Education
- MATHS 534 Research in Mathematics Education
- MATHS 535 Technology and the Teaching of Mathematics
- MATHS 580 Scientific Visualization in Mathematics and Science Teaching
- EDEL 333 Teaching Mathematics
- EDSO 371 Methods of Teaching Middle School Mathematics
- EDSO 361 Methods of Teaching Senior High Mathematics

**SELECTED HONORS AND AWARDS**

- Fulbright Scholar Grant, University of Pretoria, South Africa, May 2011
- Distinguished Paper Award. American Educational Research Association Conference, San Diego, April 13-17, 2009
- Award for Teaching Excellence. University of Idaho, 2004
- The NASA projects that I have helped direct have won awards for their WWW-based information and instructional resources. Those awards may be seen at: NASA CERES Project <http://btc.montana.edu/ceres/html/awards1.html> Yohkoh Public Outreach Project <http://solar.physics.montana.edu/YPOP/index.html>

**SCHOLARSHIP****Books**

- Thomas, D. (2002). Instructor's solutions manual for Modern Geometry. Brooks Cole Publishing Company. Pacific Grove, California. ISBN 0-534-39090-0.
- Thomas, D. (2002). Modern geometry. Brooks Cole Publishing Company. Pacific Grove, California. ISBN 0-534-36550-7.
- Thomas, D. (1997). Active geometry. Brooks Cole Publishing Company. ISBN 0-534-34485-2.
- Thomas, D. (Ed.). (1995). Scientific visualization in mathematics and science teaching. Charlottesville, Virginia: Association for the advancement of computing in education. ISBN 1-880094-09-6.
- Thomas, D and Mitchell, M. (1995). Computer visualization: New window on mathematics. In Thomas, D. (Ed.). Scientific visualization in mathematics and science teaching. Charlottesville, Virginia: Association for the advancement of computing in education. ISBN1-880094-09-6.
- Thomas, D. (1995). Math projects in the computer age. New York: Franklin-Watts. ISBN 0-531-11213-6.
- Thomas, D. (1992). Teenagers, teachers, and mathematics. Needham Heights, Massachusetts: Allyn & Bacon. ISBN 0-205-13194-8.
- Thomas, D. (1991). Children, teachers, and mathematics. Needham Heights, Massachusetts: Allyn & Bacon. ISBN 0-205-12681-2.
- Thomas, D. (1988). Math projects for young scientists. New York: Franklin-Watts. ISBN 0-531-10523-7 and ISBN 0-531-15133-6.
- Thomas, D. (1986). The math-computer connection. New York: Franklin-Watts. ISBN 0-531-10231-9.

**Selected Refereed Papers Since 1990**

- Thomas, D., Sa, L., Li, Z., & Maddux, C. (2009-2010). Structure and substance in digital discourse. *Journal of Educational Technology Systems*, 38(3), 313-340.
- Thomas, D., Li, Q., Knott, L., & Li, Z. (2008). The structure of student dialogue in web-assisted mathematics courses. *Journal of Educational Technology Systems*, 36(4), 415-431.
- Thomas, D., Li, Q. (2008). *From Web 2.0 to Teacher 2.0* (vol. Web 2.0 in Education Special Issue 2008). Binghamton, NY: Computers in the Schools/The Haworth Press Inc.
- Thomas, D. (2004). Dealing with Disruptive Students. In Chappell, M., Chopin, J., & Salls, J. (Eds). *Empowering the Beginning Teacher of Mathematics: High School*. Reston, VA: National Council of Teachers of Mathematics, 38.
- Thomas, D. (2003). The mathematics of perspective: An introduction to the cross ratio. *On-Math: Online Journal of school mathematics*, Winter 2003, Vol. 2, Num. 2. Reston, VA: National Council of Teachers of Mathematics.
- Thomas, D., Ökten, G., and Buis, P. (2002). On-line assessment of higher-order thinking skills: A Java-based extension to closed-form testing. Refereed *Proceedings of the sixth international conference on teaching statistics*, Durban, South Africa, July 7-12, 2002.
- Thomas, D., Johnson, K., and Stevenson, S. (1996). Integrated mathematics, science, and technology: An introduction to scientific visualization. *Journal of computers in mathematics and science teaching*, 15(3), 267-294.

- Thomas, D. (1995). Getting started with scientific CD-ROMs. *Educational technology review*, 4, 7-12.
- Thomas, D. (1992). Using computer visualization to motivate and support mathematical dialogues. *Journal of computers in mathematics and science teaching*, 11(3/4), 265-274.
- Thomas, D. (1990). Turtle tessellations. *Journal of computers in mathematics and science teaching*, 9(4), 25-34.
- Thomas, D. (1990). Give meaning to matrices with MATLAB. *Journal of computers in mathematics and science teaching*, 9(3), 73-85.

### **Selected Peer Reviewed/Evaluated Papers Since 1993**

- Thomas, D. & Maddux, C. D. (2009). Analysis of Asynchronous Discourse in Web-assisted and Web-based Courses. Recipient, Distinguished Paper Award, American Education Research Association Meeting, San Diego, April 13-17.
- Thomas, D. (2008). From Web 2.0 to Teacher 2.0. *Proceedings of the 20<sup>th</sup> International Conference on Technology in Collegiate Mathematics*, San Antonio, March 6-9, 2008.
- Thomas, D., Boisen, B., Thomas, C., Johnson, T., Li, Z., Windley, A., (2005). Gateway to Mathematics. *Proceedings of E-Learn 2005*, Vancouver BC, Oct 25-28, pp. 2424 - 2429.
- Thomas, D (2003). Mathematical communication in a web-supported undergraduate geometry class. *Proceedings of the 16<sup>th</sup> international conference on technology in collegiate mathematics*. Chicago, IL, October 30-November 2, 2003.
- Thomas, D. (2003). A geometer's toolkit. *Proceedings of the 15<sup>th</sup> international conference on technology in collegiate mathematics*. Orlando, Florida, October 31-November 2, 2002.
- Thomas, D. (1999) (Invited). Developing and delivering Internet-based professional development courses for elementary and secondary mathematics and science teachers: An educational grand challenge. *Proceedings of the international conference and exhibition on education superhighway 1999*. Penang, Malaysia, November 29-December 1, 1999.
- Thomas, D. (1999). Teaching geometry on-line. *Proceedings of the Sixteenth international conference on technology and education*, Edinburgh, UK. March 28-31, 1999, 337-339.
- Thomas, D., Churchill, L., and Thomas, C. (1998). Lessons learned from the Network Montana Project. INET'98: *Proceedings of the 1998 meeting of the Internet Society*. Geneva, Switzerland, July 21-24, 1998.
- Thomas, D. (1997) (Invited). Meet me in Montana: Internet-based research and development. *Proceedings of the AGENE 7th annual conference*, Kyoto, Japan, December 13-14, 1997.
- Thomas, D. and Thomas, C. (1997). Using Internet-based K-12 classroom activities: Materials and staff development. *INET'97: Proceedings of the 1997 meeting of the Internet Society*. Kuala Lumpur, Malaysia, June 24-27, 1997.
- Thomas, D. (1996). Internet-based inservice teacher training in Montana. *Proceedings of EI'96 Second international UNESCO congress on education and informatics*. Moscow, Russia, July 1-5, 1996.
- Thomas, D. (1993) (Invited). Discovering the power of postulates. *Proceedings of the 7<sup>th</sup> conference on computer-assisted instruction*. Taipei, Taiwan, May 26-27, 1993.
- Thomas, D. and Sabelli, N. (1993). Visualization in mathematics and science teaching. *Rethinking the roles of technology in education: Proceedings of the tenth international conference on technology in education*, (166-168). Cambridge, March 21-24, 1993.

### **Selected Presentations Since 1997** (not previously mentioned):

- Thomas, D. (2011). The geometry of perspective: An introduction to the cross ratio.

- NCTM Annual Meeting, Indianapolis, Indiana, April 13-16, 2011.
- Thomas, D. (2007). The structure of student dialogue in web-assisted mathematics courses [poster]. Supercomputing 2007, Reno, NV, November 13, 2007.
  - Thomas, D. & Thomas, C. (2007). Developing, delivering, and researching web-based mathematics and mathematics education courses [Invited]. National Center for Mathematics and Physics, King Abdulaziz City for Science and Technology, Riyadh, Saudi Arabia, May 16, 2007.
  - Thomas, D. (2005). Teaching Algebra Concepts with Technology. NCTM Annual Meeting. Anaheim, CA, April 1 - 6, 2005.
  - Thomas, D. (2004). Geometry in Space, NCCE Conference, Spokane, WA, April 15, 2004
  - Thomas, D. (2004). Lessons Learned: Fostering a Pedagogic Frame of Reference for the Use of Mathematical Modeling Technologies, International Congress of Mathematics Education, Copenhagen, Denmark, July 5-10, 2004.
  - Thomas, D. (2001). Internet-based mathematics and mathematics education courses for teachers. NCTM Annual Meeting. Orlando, Florida, April 4-7, 2001.
  - Thomas, D. (2001). Creating WWW-based demonstrations using the JavaSketchpad. Abstracts of Papers Presented to the American Mathematical Society. 22(1). Annual Meeting of the American Mathematical Society. New Orleans, Louisiana, January 10-13, 2001.
  - Thomas, D. (2000). Geometry in the modern world. ICTM 2000 Annual Conference. Indianapolis, Indiana, November 5-6, 2000.
  - Thomas, D. (2000). Teacher-to-teacher: Muncie-to-Moscow: A cross cultural dialogue between U.S. and Russian teachers and students (Invited). The World Bank Education Reform Project Conference. Moscow, Russia, October 13, 2000.
  - Thomas, D. (2000). Teaching geometry on-line. AMS Annual Meeting, Washington, DC, January 19-23, 2000.
  - Thomas, D., Thomas, C., and Hurst, L. (1998). The Internet as an information resource. K-12 Workshop, INET'98: The 1998 meeting of the Internet Society. Geneva, Switzerland, July 21-24, 1998.
  - Thomas, D., Beaudrie, B., Slater, T. (1997). On-line K-12 Earth systems science lessons that use web resources. Poster presented at SC97. San Jose, California, November 15-21, 1997.
  - Thomas, D., Stevenson, S., Slater, T. (1977). Project CERES: Bringing NASA resources into the classroom. Workshop presented at SC97. San Jose, California, November 15-21, 1997.
  - Thomas, D. and Thomas, C. (1997). Educational uses of the World Wide Web. INET'97: Annual meeting of the Internet Society. Kuala Lumpur, Malaysia, June 24-27, 1997.
  - Thomas, D. and Thomas, C. (1997). Providing professional development about the Internet via the Internet. INET'97: Annual meeting of the Internet Society. Kuala Lumpur, Malaysia, June 24-27, 1997.

### **Selected Grants and Contracts Since 1990**

Grants for research/creative endeavors as PI/CoI:

- Northern Nevada Mathematics Initiative, Sponsored by the Nevada Department of Education, \$420,000. June 2009.
- Pathways-to-Aviation, Sponsored by Reno Air Race Foundation, \$20,000. October 24, 2008
- NSLA Database Training, Sponsored by Nevada State Library and Archives, State, \$39,949.52. December 9, 2008

- Improving Middle School Mathematics. Idaho Technology Incentive Grant, Idaho State Board of Education, 2006, \$56,908.
- Coeur d'Alene Mathematics Project (Year Three). Mathematics and Science Partnership Grant, Idaho Department of Education, 2006, \$205,417.
- Gateway to Calculus Project, U.S. Congress, 2004, \$694,400.
- Northern Idaho Mathematics Project, Idaho Department of Education, 2005, \$192,022
- CdA - Mathematics Project. Idaho Department of Education, 2004, \$193,069.
- New Generation Explorers Project. Toyota USA Foundation, 2003, \$217,700.
- Idaho Math Academy. State Department of Education, 2003, \$29,394.
- Geometry in Space, Indiana Space Grant Consortium, 2001, \$28k.
- *Development of a computer interface for grid-based assessment* (2001). BSU Research Program, \$15,000. Co-PI with Paul Buis.
- The NASA CERES Project (1996) (<http://btc.montana.edu/ceres/>). Funded by a \$1M grant from NASA Headquarters. Co-Investigator on the project with G. Tuthill, K. Obbink, and T. Slater. In addition to classroom-ready materials using contemporary teaching strategies, CERES developed several on-line NASA data search engines and two graduate level distance learning courses, available over the internet to K-12 teachers.
- The Network Montana Project (1995) (<http://www.math.montana.edu/~nmp/>). Funded by a \$2.5M grant (RED-9554251, 1995) from the National Science Foundation and was preceded by a \$105k planning grant (RED-9454691, 1994). Co-PI on the project with L. Churchill.
- Yohkoh Public Outreach Project (1995). (<http://solar.physics.montana.edu/YPOP>). Co-Investigator on the project with L. Acton and T. Slater. \$700k NASA CAN-0A94-1.

Grants for professional development:

- MSU sabbatical leave, autumn term 1993.
- AWU-DOE Faculty Fellowship. Cognitive Systems Engineering Group, Los Alamos National Laboratory, summer 1991.
- AWU-DOE Faculty Fellowship. Cognitive Systems Engineering Group, Los Alamos National Laboratory, summer 1990.
- Visiting Fellow, Science and Mathematics Education Centre, Curtin University of Technology, Perth, Western Australia, August 6-September 17, 1987.

**SELECTED PROFESSIONAL MEMBERSHIPS AND SERVICE:**

- National Council of Teachers of Mathematics
- Idaho Council of Teachers of Mathematics
- Montana Council of Teachers of Mathematics
- American Mathematical Society
- Association for the Advancement of Computing in Education
  - Journal of Computers in Mathematics and Science Teaching
    - Associate Editor, 1997-2000
    - Monograph editor, 1995
  - Program Chair, M/SET Conference, 1999
- International Conference on Technology in Collegiate Mathematics (ICTCM)
  - Board of Directors
  - Program Committee
- Palouse Discovery Science Center, Board of Directors
- Northern Nevada Mathematics Council, Board of Directors