
Fran Arbaugh Vita

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Education

Ph. D. Curriculum & Instruction/Mathematics Education. Indiana University. Bloomington, Indiana. November 2000.

Ph. D. Dissertation: "Time on Tasks: Influences of a Study Group on Secondary Math Teachers' Knowledge, Thinking, and Teaching." Directed by Dr. Catherine A. Brown. Indiana University. Bloomington, Indiana.

M. Ed. Curriculum & Instruction/Secondary Mathematics Education. Virginia Commonwealth University. Richmond, Virginia. May 1996.

Teacher Certification in Secondary Mathematics. Virginia Commonwealth University and J. R. Reynolds Community College. Richmond, Virginia. May 1985.

B.S. Family and Child Development/Option in Human Services. Virginia Tech. Blacksburg, Virginia. June 1983.

Professional Experience

Associate Professor of Mathematics Education and Curriculum & Supervision: The Pennsylvania State University, University Park, Pennsylvania. August 2009 – Present.

Associate Professor of Mathematics Education: University of Missouri, Columbia, Missouri. September 2007 – August 2009.

Assistant Professor of Mathematics Education: University of Missouri, Columbia, Missouri. January 2001 – August 2007.

Doctoral Teaching/Research Assistant: Department of Curriculum & Instruction. Indiana University, Bloomington, Indiana. August 1996 – December 2000.

Adjunct Faculty: Department of Teaching and Learning. Indiana University/Purdue University – Indianapolis (IUPUI), Indianapolis, Indiana. Summer 1998.

Field Placement Coordinator: Department of Curriculum & Instruction/Elementary Mathematics and Science Preservice Teachers. Indiana University. Bloomington, Indiana. August 1996-May 1997.

High School Mathematics Teacher: Manchester High School, Chesterfield County, Virginia. August 1985 – June 1996.

Honors and Awards

Teaching Awards

Missouri Council of Teachers of Mathematics (MCTM) Post-Secondary Mathematics Teacher of the Year (2007)
MU William T. Kemper Fellowship for Teaching Excellence (2007)
MU Excellence in Education Award (2005)
College of Education High Flyer Teaching Award for Outstanding Student Evaluation of Teaching (in one or more courses during the 2006-07, 2004-05, 2003-04, 2001-02, and 2000-01 academic years)
Outstanding Mathematics Teacher. Tandy Corporation (1994-1995)
Teacher of the Year. Manchester High School (1993-1994)

Teaching Recognition

Outstanding Teaching Award Nominee, PSU College of Education (Spring 2012)
Mizzou 39 Faculty Mentor (Diane Crowe, 2006; Tiffany McCracken, 2005)
Departmental Nominee for the Provost Outstanding Junior Faculty Teaching Award (2004)
Mentor for MU Honors Convocation (2005, 2004, 2003, 2002)
Graduation Speaker. Manchester High School (1996)

Other Honors

University Graduate School Fellowship. Indiana University. (1997-98; 1996-97)

Teaching and Advisement

Undergraduate

Courses Taught at Penn State

MTHED 433: Function Concepts in Secondary Mathematics (Fall 2013). Elective course for secondary mathematics education majors.
MTHED 497A: Reasoning-and-Proving in Secondary Mathematics (Summer 2011, Fall 2012 [.5]). Elective course for secondary mathematics education majors, masters students, doctoral students, and in-service mathematics teachers.
MTHED 431: Data Analysis in Secondary School Mathematics (Fall 2009). Elective course for secondary mathematics education majors.
MTHED 411: Teaching Secondary Mathematics 1 (Spring 2010, Fall 2010, Fall 2011, Fall 2012 [.5], Fall 2013). Required course for secondary mathematics education majors.

Courses Taught at University of Missouri:

- TDP4570 Introduction to Teaching Mathematics in Middle and Secondary Schools (Fall 2008)
- TDP4300 Learning and Teaching Number and Operation in the Elementary Classroom (Fall 2006)
- ED352/TDP4580 Teaching Mathematics in Secondary School: Focus on Algebra (Winter 2006 [Writing Intensive]; Winter 2005 [WI]; Winter 2004; Winter 2003 [WI]; Winter 2002; Winter 2001)
- ED332 Teaching and Modeling Middle School Mathematics (Fall 2002)
- ED100 Orientation Seminar for Secondary Mathematics Teachers (Fall 2003; Fall 2002; Fall 2001)

Undergraduate Advising at Penn State:

- 2009-2010: Twenty (20) secondary mathematics education students
- 2010-2011: Thirty-one (31) secondary mathematics education students
- 2011-2012: Thirty (30) secondary mathematics education students
- 2012-2013: Twenty-six (26) secondary mathematics education students (reassigned October 2012-August 2013 due to leave)
- 2013-2014: Thirty-four (34) secondary mathematics education students

Undergraduate Advisement at University of Missouri (2001-2009):

Eighty-three (83) secondary mathematics education students.

Graduate

Courses Taught at Penn State:

- CI 590: Colloquium in Curriculum & Supervision (Spring, 2012).
- CI 502: Qualitative Research in Curriculum & Instruction I (Spring, 2012; Spring 2014). Required course for C&I doctoral students; also taken by doctoral students across the COE and PSU.
- MTHED 504: Foundations of Mathematics Education, IV (Spring, 2011). Required course for the mathematics education doctoral program.
- MTHED 590: Colloquium in Mathematics Education (Spring 2010).

Courses Taught at University of Missouri:

- C&I 8900: Seminar in Curriculum & Instruction -- Algebraic Thinking in Grades K-12 (Fall 2007). Course for CSMC K-12 Cohort.
- C&I 8890: Research in Mathematics Education (Winter 2007). Course in the Mathematics Education doctoral core.
- C&I 8895 Advanced Methods of Teaching Secondary Mathematics (Winters 2008, 2007, 2006). Course for the middle and secondary mathematics Fellows.
- C&I 8870 Mathematics Teaching and Teacher Education (Fall 2008, Fall 2005, Fall 2001). Course in the Mathematics Education doctoral core.
- TDP 7370/7590 Teaching and Modeling Middle School Mathematics/Teaching Mathematics in Secondary Schools: Focus on Geometry, Probability, and Statistics

- (Fall 2004). Combined middle and secondary mathematics methods course for post-baccalaureate certification students enrolled in the SMAR²T program.
- T410 Technology and Mathematics Education (Fall 2003). Developed new course for Mathematics Education doctoral core.
- T410 Mathematics Teaching and Teacher Education (Fall 2001). Developed new course for Mathematics Education doctoral core.
- T410 Algebraic Thinking in the Middle Grades (Summer 2001). Developed new course for Mathematics Education graduate program.

Graduate Advisement at Penn State:

- MEd: Megan Lynch (Curriculum & Supervision; May 2013-present)
- MEd: Jill Valente (Mathematics Education; January 2011-May 2012; did not complete)
- MEd: Nursen Konuk (Mathematics Education; Fall 2009 – December 2011; completed)
- PhD committee member: Monica Smith, C&I (mathematics education)
- PhD program advisor: Nursen Konuk (January 2012-present)
- PhD program advisor, dissertation advisor: Ben Freeburn (Fall 2010-present), Candidacy in March 2011; Comprehensive exams completed in May 2013, Dissertation Proposal approved in August 2013
- PhD dissertation advisor: Maureen Grady (Fall 2010-present), Comprehensive Exams completed in September 2011; Dissertation Proposal approved in March 2012; Successful Defense June 13, 2013; Graduated August 10, 2013.
- PhD committee member: Tenille Cannon, C&I (mathematics education), Comprehensive exams completed in May 2012
- PhD committee member: Heather Ervin, PhD in C&I (mathematics education), Candidacy completed in April, 2011
- PhD committee member: Brian McDonald, PhD in C&I (language, culture, and society – english education), proposal defense passed Fall 2011.
- PhD committee member: Tom Kamerling, PhD in C&I (mathematics education)
- PhD committee member: Monica Smith, PhD in C&I (mathematics education)

Graduate Advisement at University of Missouri (2001-present):

- Dissertation Co-Chair (Cynthia Taylor; defense April 2011)
- Dissertation Chair (Aina Appova; defense August 2009)
- Dissertation Co-Chair (Debbie Wiengarth; Elementary Education; defense Fall 2006)
- Doctoral program advisor of 5 mathematics education doctoral students
- Advisor of 27 mathematics education Fellows (Master's of Learning and Instruction)
- Supervised 26 Master's projects for post-baccalaureate certification/Master's students
- Member of 10 doctoral program committees
- Member of 22 dissertation committees

Extension (Professional Development for Mathematics and/or Science Teachers)

- Identifying Big Ideas for Responsive Teaching Using Math Expressions.* State College Area School District K-5 Curriculum day workshops, November 1, 2013. Co-Presenter.
- Productive Math Talk Moves.* State College Area School District K-5 Curriculum day workshops, November 4, 2011. Co-presenter.

- Task Transformation to Promote 21st Century Mathematical Thinking Workshop*.
University of Virginia Office of Mathematics Outreach. Charlottesville, VA. August 3-4, 2011.
- Hurricane Workshop* for the *Middle Grade Earth and Space Science Education* project.
Central Pennsylvania science teachers – funded through the National Science Foundation as a Targeted Math Science Partnership. State College, PA. June 27-July 1, 2011.
- Supporting Teachers: Amplifying Children’s Knowledge (STACK)*. Mathematics and Science Partnership (MSP) project. Columbia Public Schools - funded through the Missouri Department of Elementary and Secondary Education. January 2007-June 2009; June 2010.
- Columbia Public Schools (CPS) Secondary Mathematics Curriculum Day (August 2007)
CPS Elementary Mathematics Leaders (February 2006)
CPS Elementary Teachers (August 2005)
- Core-Plus Workshops* for CPS 8-12 Teachers (Summers 2005, 2004, 2003; February 2003; November 2002)
- K-12 CPS Mathematics Week (Summer 2005)
- Connected Mathematics Project Workshops* for CPS (Summers 2004, 2003)
- Mathematics and Science Teacher Leadership Academy* (Summers 2006, 2005, 2004)

Books Authored and Edited

- Smith, M. S., Arbaugh, F., Boyle, J., Steele, M, and Sylianides, G. (in preparation). *Cases of reasoning-and-proving: A teacher education curriculum for secondary mathematics (working title)*.
- Arbaugh, F., Lloyd, G., Wieman, R., Freeburn, B., & Lynch, C., (in preparation). *Success from the start: Rethinking homework practices in secondary mathematics*. Reston, VA: National Council of Teachers of Mathematics.
- Wieman, R., & Arbaugh, F. (2013). *Success from the start: Your first years of teaching secondary mathematics*. Reston, VA: National Council of Teachers of Mathematics.
- Friel, S. N., Arbaugh, F., Mooney, E. S., Pugalee, D. K., Watanabe, T., & Smith, M. S. (2009). *Navigating through Problem Solving in Grades 6-8*. Reston, VA: National Council of Teachers of Mathematics.
- Arbaugh, F., & Taylor, P. M. (Eds.). (2008). *Inquiry into mathematics teacher education*. Monograph 5 of the Association of Mathematics Teacher Educators (AMTE). San Diego, CA: AMTE.
- Meyer, M., Langrall, C., Arbaugh, F., Webb, D., & Hoover, M. (Eds.). (2008). *A decade of middle school mathematics curriculum implementation: Lessons learned from the Show-Me Project*. Charlotte, NC: Information Age Publishing.

Pugalee, D., Arbaugh, F., Bay-Williams, J., Farrell, A., Mathews, S., & Royster, D. (2008). *Navigating through Connections in Grades 6-8*. Reston, VA: National Council of Teachers of Mathematics.

Refereed Journal Articles

Arbaugh, F., Marra, R., Lannin, J. K., Merle, D., Cheng, Y., & Smith, R. (in review, submitted January 6, 2014). Supporting university content specialists in providing effective professional development: The educative role of evaluation. *Teacher Development*.

Arbaugh, F., Taylor, C., Bruton, R., Chval, K. B., Lannin, J. K., Hicks, S., & Webb, M. (in review, submitted January 20, 2014). Examining expert secondary teachers' knowledge for teaching mathematics. *Journal for Research in Mathematics Education*.

Weiman, R. & Arbaugh, F. (in press). How to create effective mathematics homework. *Mathematics Teaching in the Middle School*.

Karunakaran, S., Freeburn, B., Konuk, N., & Arbaugh, F. (in press). Improving pre-service secondary mathematics teachers' capability with generic example proofs. *Mathematics Teacher Educator*.

Lannin, J.K., Webb, M., Chval, K.B., Arbaugh, F., Hicks, S., Taylor, C. & Bruton, R. (2013). The development of beginning mathematics teacher pedagogical content knowledge. *Journal of Mathematics Teacher Education*, 16(6), 403-426. doi: 10.1007/s10857-013-9244-5

Marra, R.M., Arbaugh, F., Lannin, J., Abell, S., Ehlert, M., Smith, R., Merle-Johnson, D., Park Rogers, M. (2011). Orientations to professional development design and implementation: Understanding their relationship to PD outcomes across multiple projects. *International Journal of Science and Mathematics Education*, 9, 793-816.

Boone, W. J., Abell, S. K., Volkmann, M. J., Arbaugh, F., & Lannin, J. K. (2011). Evaluating selected perceptions of science and mathematics teachers in an alternative certification program. *International Journal of Science and Mathematics Education*, 9, 551-569.

Arbaugh, F., Chval, K., Van Garderen, D., Lannin, J., & Cummings, L. (2010). Supporting the Transition from Experienced Teacher to Mathematics Coach. *Journal of Mathematics Education Leadership*, Spring 2010, 13-19.

Chval, K.B., Arbaugh, F., Van Garderen, D., Lannin, J.K., Cummings, L., Duchene, A., & Huey, M. (2010). The transition from experienced teacher to mathematics coach: Establishing a new identity. *The Elementary School Journal*, 11(1), 191-216.

Park Rogers, M. A., Abell, S. K., Marra, R. M., Arbaugh, F., Hutchins, K. L., & Cole, J. S. (2010). Orientations to science teacher professional development: An exploratory study. *Journal of Science Teacher Education*, 21, 309-328.

- Chval, K.B., Lannin, J., Arbaugh, F., & Sutter, A. (2009). Videos and prospective teachers. *Teaching Children Mathematics*, 15(2), 98-105.
- Hutchins, K., Arbaugh, F., Abell, S., Marra, R., & Lee, M. (2008). A consumer guide to professional development. *Science Scope*, 31(8), 16-19.
- Friedrichsen, P., Lannin, J., Abell, S., Arbaugh, F., & Volkmann, J. (2008). Examining incoming identities in an alternative certification program for mathematics and science. *Eurasia Journal of Mathematics, Science & Technology Education*, 4(2), 175-188.
- Arbaugh, F., Abell, S., Lannin, J., Volkmann, M., & Boone, W. (2007). Field-based internship models for alternative certification of science and mathematics teachers: Views of interns, mentors, and university educators. *Eurasia Journal of Mathematics, Science & Technology Education*, 3(3), 191-201.
- Lannin, J.K., Arbaugh, F., Barker, D.D., & Townsend, B.E. (2006). Making the most of student errors. *Teaching Children Mathematics*, 13(3), 182-186.
- Arbaugh, F., Lannin, J., Jones, D. L., & Park Rogers, M. (2006). Examining instructional practices in Core-Plus lessons: Implications for professional development. *Journal of Mathematics Teacher Education*, 9(6), 517-550.
- Abell, S., Boone, W., Arbaugh, F., Lannin, J., Beilfuss, M., & Volkmann, M. (2006). Recruiting future science and mathematics teachers into alternative certification programs: Strategies tried and lessons learned. *Journal of Science Teacher Education*, 17(3), 165-183.
- Arbaugh, F. & Brown, C. A. (2005). Analyzing mathematical tasks: A catalyst for change? *Journal of Mathematics Teacher Education*, 8, 449-536.
- Jones, D. L., & Arbaugh, F. (2004). Take time for action: What do students know about time? *Mathematics Teaching in the Middle School*, 10(2), 82-84.
- Arbaugh, F. (2003). Study groups as a form of professional development for secondary mathematics teachers. *Journal of Mathematics Teacher Education* 6(2), 139-163.
- Arbaugh, F. (2003). Study groups: Professional growth through collaboration. *Mathematics Teacher*, 96(3), 188-191.
- Arbaugh, F., Scholten, C. & Essex, N. K. (2001). Data in the middle grades: A probability webquest. *Mathematics Teaching in the Middle School*, 7(2), 90-95.
- Reys, B., & Arbaugh, F. (2001). Clearing up the confusion over calculator use in grades K-5. *Teaching Children Mathematics*, 8(2), 90-94.

Book Chapters

- Smith, M.S., Boyle, J., Arbaugh, F., Steele, M.D., & Stylianides, G. (2014). Cases as a vehicle for developing knowledge needed for teaching. To appear in Y. Li & E. A. Silver (Eds.), *Transforming mathematics instruction: Multiple approaches and practices*. Springer.
- Arbaugh, F., Nolan, J., Parks, K., & Burns, R. (2012). The practices and knowledge of school-based teacher education practitioners. In M. Macintyre Latta & S. Wunder (Eds.), *Placing practitioner knowledge at the center of teacher education: Rethinking the policy and practice of the education doctorate*. Charlotte, NC: Information Age Publishing.
- Arbaugh, F. (2011). The Learning Principle: Supporting the development of mathematical proficiency. In G. M. Lloyd and V. R. Pitts Bannister (Eds.), *Curriculum-based activities and resources for pre-service math teachers*. Reston, VA: National Council of Teachers of Mathematics.
- Arbaugh, F., Lannin, J. K., Jones, D. L., & Barker, D. (2010). Textbook-specific professional development: Impacting teachers' knowledge and views. In J. Luebeck, & J. W. Lott (Eds.), *Mathematics teaching: Putting research into practice at all levels* (Association of Mathematics Teacher Educators (AMTE) Monograph 7) (pp. 91-108). San Diego, CA: AMTE.
- Arbaugh, F. (2010). Secondary mathematics teachers' classroom practices. In J. Lobato, & F. K. Lester Jr. (Eds.), *Teaching and learning mathematics: Translating research to the secondary classroom* (pp. 45-51). Reston, VA: National Council of Teachers of Mathematics.
- Arbaugh, F. (2010). Qualities of effective secondary mathematics teachers. In J. Lobato, & F. K. Lester Jr. (Eds.), *Teaching and learning mathematics: Translating research to the secondary classroom* (pp. 53-59). Reston, VA: National Council of Teachers of Mathematics.
- Arbaugh, F. (2009). Learning from each other: Why (and how) to do classroom observations with your colleagues. In A Flores (Ed.), *Responding to diversity: Grades 9-12* (pp. 127-134). Reston, VA: National Council of Teachers of Mathematics.
- Arbaugh, F., & Avery, P. (2009). Enhancing the learning environment through student-led mathematical discussions. In A Flores (Ed.), *Responding to diversity: Grades 9-12* (pp. 7-16). Reston, VA: National Council of Teachers of Mathematics.
- Arbaugh, F. (2008). Engaging pre-service teachers in textbooks analyses: A focus on mathematical tasks. In P. M. Lutz (Ed.), *Secondary mathematics methods courses in California* (California Association of Teachers of Mathematics Monograph 1) (pp. 50-59). Available: <http://edweb.csus.edu/projects/camte/>

- Arbaugh, F. (2008). Teachers' needs at different phases of curriculum implementation. In M. Meyer, C. Langrall, F. Arbaugh, D. Webb, & M. Hoover (Eds.), *A decade of middle school mathematics curriculum implementation: Lessons learned from the Show-Me Project* (pp. 191-199). Charlotte, NC: Information Age Publishing.
- Meyer, M., & Arbaugh, F. (2008). Professional development for administrators: What they need to know to support curriculum adoption and implementation. In M. Meyer, C. Langrall, F. Arbaugh, D. Webb, & M. Hoover (Eds.), *A decade of middle school mathematics curriculum implementation: Lessons learned from the Show-Me Project* (pp. 201-210). Charlotte, NC: Information Age Publishing.
- Philips, E., Lappan, G., Grant, Y., & Arbaugh, F. (2008). An overview of professional development. In M. Meyer, C. Langrall, F. Arbaugh, D. Webb, & M. Hoover (Eds.), *A decade of middle school mathematics curriculum implementation: Lessons learned from the Show-Me Project* (pp. 141-150). Charlotte, NC: Information Age Publishing.
- Arbaugh, F., & Taylor, P. M. (2008). Inquiry into mathematics teacher education. In F. Arbaugh & P. M. Taylor (Eds.), *Inquiry into mathematics teacher education*. Monograph 5 of the Association of Mathematics Teacher Educators (AMTE) (pp. 1-9). San Diego, CA: AMTE.
- Smith, M., Arbaugh, F., & Fi, C. (2007). Teachers, the school environment, and students: Influences on students' opportunity to learn mathematics in grades 4 & 8. In P. Kloosterman & F. K. Lester (Eds.), *Results from the 2003 Mathematics Portion of the National Assessment of Educational Progress* (pp. 191-226). Reston, VA: National Council of Teachers of Mathematics.
- Lynch-Davis, K., & Arbaugh, F. (2006). Improving classroom assessment practices through analyzing NAEP items. In C. A. Brown & L. Clark (Eds.), *Learning from NAEP: Professional development materials for mathematics teachers* (pp. 124-147). Reston, VA: National Council of Teachers of Mathematics.
- Arbaugh, F., & Brown, C. A. (2004). What makes a mathematical task worthwhile? Designing a learning tool for high school mathematics teachers. In R. Rubenstein (Ed.), *Perspectives on the Teaching of Mathematics* (pp. 27-41). Reston, VA: National Council of Teachers of Mathematics.
- Smith, M. S., Stein, M. K., Arbaugh, F., Brown, C. A., & Mossgrove, J. (2004). Characterizing the cognitive demands of mathematical tasks: A task-sorting activity. *Professional development guidebook for perspectives on the teaching of mathematics: Companion to the sixty-sixth yearbook* (pp. 45-72). Reston, VA: National Council of Teachers of Mathematics.
- Arbaugh, F., Brown, C. A., Lynch, R. K., & McGraw, R. (2004). Students' ability to construct responses (1992-2000): Findings from short and extended constructed-response items. In P. Kloosterman & F. K. Lester (Eds.), *The 1990 through 2000 mathematics assessments of*

the National Assessment of Educational Progress: Results and interpretations (pp. 337-362). Reston, VA: National Council of Teachers of Mathematics.

Editorials

- Knight, S. L., Lloyd, G. M., Arbaugh, F., McDonald, S., Nolan, J., Whitney, A. E. (2014). Research as a catalyst for change. *Journal of Teacher Education*, 65(2), 86-87.
- Knight, S. L., Lloyd, G. M., Arbaugh, F., McDonald, S., Nolan, J., Whitney, A. E. (2014). Introduction of the 2014 editorial review board. *Journal of Teacher Education*, 65(1), 5-6.
- Knight, S. L., Lloyd, G. M., Arbaugh, F., Edmondson, J., Nolan, J., McDonald, S., & Whitney, A. E. (2013). Theme issue: Talking across the disciplines. *Journal of Teacher Education*, 64(5), 376-377.
- Knight, S. L., Lloyd, G. M., Arbaugh, F., Edmondson, J., Nolan, J., McDonald, S., & Whitney, A. E. (2013). Topics in teacher education research: What do we publish? *Journal of Teacher Education*, 64(4), 292-293.
- Knight, S. L., Lloyd, G. M., Arbaugh, F., Edmondson, J., McDonald, S., Nolan, J., & Whitney, A. E. (2013). Teacher learning and standards-based instruction. *Journal of Teacher Education*, 64(3), 200-201.
- Knight, S. L., Nolan, J., Lloyd, G. M., Arbaugh, F., Edmondson, J., & Whitney, A. E. (2013). Quality teacher education research: How do we know it when we see it? *Journal of Teacher Education*, 64(2), 114-116.
- Arbaugh, F., Lloyd, G. M., Knight, S. L., Nolan, J., Edmondson, J., Whitney, A. E., & McDonald, S. (2013). Teacher learning and perceptions across the professional continuum. *Journal of Teacher Education*, 64(1).
- Knight, S. L., Edmondson, J., Lloyd, G. M., Arbaugh, F., Nolan, J., Whitney, A. E., & McDonald, S. (2012). Examining the complexity of assessment and accountability in teacher education. *Journal of Teacher Education*, 63(5)
- Lloyd, G. M., Arbaugh, F., Knight, S. L., Edmondson, J., Nolan, J., McDonald, S. P., & Whitney, A. E. (2012). Beyond the teacher certification program debate: From models to features. *Journal of Teacher Education*, 63(3).
- Knight, S. L., Lloyd, G. M., Arbaugh, F., Edmondson, J., Nolan, J., McDonald, S. P., & Whitney, A. E. (2012). Adding to the knowledge base. *Journal of Teacher Education*, 63(2), 85-86.
- Knight, S. L., Lloyd, G. M., Arbaugh, F., Edmondson, J., Nolan, J., McDonald, S. P., & Whitney, A. E. (2012). Getting our own house in order: From brick makers to builder. *Journal of Teacher Education*, 63(1).

Knight, S. L., Lloyd, G. M., Arbaugh, F., Edmondson, J., Nolan, J., McDonald, S. P., & Whitney, A. E. (2011). Advancing research, practice, and policy in teacher education. *Journal of Teacher Education, 62*(5).

Refereed Proceedings

Arbaugh, F., Lannin, J., Barker, D., & Jones, D. L. (2005). Curriculum-specific professional development: A phenomenographical study of teachers' perceptions. In G. M. Lloyd, S. Wilson, J. L. M. Wilkins, & S. L. Behm (Eds.), *Proceedings of the twenty-seventh annual meeting of the North American chapter of the International Group for the Psychology of Mathematics Education*. Blacksburg, VA: Virginia Tech.

Arbaugh, F. (2005). Inservice teacher education: Investigating mathematics teachers' professional growth. In G. M. Lloyd, S. Wilson, J. L. M. Wilkins, & S. L. Behm (Eds.), *Proceedings of the twenty-seventh annual meeting of the North American chapter of the International Group for the Psychology of Mathematics Education*. Blacksburg, VA: Virginia Tech.

Arbaugh, F., Brown, C. A., & McGraw, R. (2003). The messy work of professional development: The conversation continues. In N. A. Pateman et al. (Eds.), *Proceedings of the Twenty-seventh Conference of the International Group for the Psychology of Mathematics Education held jointly with the Twenty-fifth Conference of PME-NA* (Volume 1, p. 193). Honolulu: University of Hawaii.

McGraw, R., Arbaugh, F., Lynch, K., & Brown, C. A. (2003). Mathematics teacher professional development as the development of communities of practice. In N. A. Pateman et al. (Eds.), *Proceedings of the Twenty-seventh Conference of the International Group for the Psychology of Mathematics Education held jointly with the Twenty-fifth Conference of PME-NA* (Volume 3, p. 269-276). Honolulu: University of Hawaii.

Arbaugh, F., Brown, C. A., & McGraw, R. (2002). The messy work of professional development: The conversation continues. In D. S. Mewborn et al. (Eds.), *Proceedings of the twenty-fourth annual meeting of the North American chapter of the International Group for the Psychology of Mathematics Education* (p. 139). Columbus, OH: ERIC Clearinghouse for Mathematics, Science, and Environmental Education.

Brown, C. A., McGraw, R., Koc, Y., Lynch, K., & Arbaugh, F. (2002). Lesson study in secondary mathematics. In D. S. Mewborn et al. (Eds.), *Proceedings of the twenty-fourth annual meeting of the North American chapter of the International Group for the Psychology of Mathematics Education* (p. 1427). Columbus, OH: ERIC Clearinghouse for Mathematics, Science, and Environmental Education.

Brown, C., Arbaugh, F., Allen, A., & Koc, Y. (2000). Learning together: Teachers' use of common planning time. In M. L. Fernandez (Ed.), *Proceedings of the twenty-second annual meeting of the North American chapter of the International Group for the*

Psychology of Mathematics Education (p. 620). Columbus, OH: ERIC Clearinghouse for Mathematics, Science, and Environmental Education.

On-Line Curricular Materials for Mathematics Teachers

Arbaugh, F., Galindo, E., & Hart, E. (2000). Teaching, learning, and communicating about fractions. The National Council of Teachers of Mathematics Illuminations Website [Online]. Available: <http://illuminations.nctm.org/reflections/3-5/Fractions/index.html>

Arbaugh, F. & Galindo, E. (2000). Learning about area, perimeter, and fractions with and from peers. The National Council of Teachers of Mathematics Illuminations Website [Online]. Available: <http://illuminations.nctm.org/reflections/6-8/LearningWithPeers/index.html>

Reports

Arbaugh, F., Herbel-Eisenmann, B., Ramirez, N., Knuth, E., Kranendonk, H., & Quander, J. (2010). *Linking research and practice: The NCTM research agenda conference report*. Access online at: www.nctm.org.

Abell, S., Arbaugh, F., Ehlert, M., & Lannin, J. (2009). *Missouri Department of Higher Education Improving Teacher Quality Grants Cycle 6 external evaluation report*. Columbia, MO: Southwestern Bell Science Education Center, University of Missouri-Columbia.

Abell, S., Arbaugh, F., Ehlert, M., Lannin, J., & Marra, R. (2008). *Missouri Department of Higher Education Improving Teacher Quality Grants Cycle 5 external evaluation report*. Columbia, MO: Southwestern Bell Science Education Center, University of Missouri-Columbia.

Abell, S., Ehlert, M., Lannin, J., Marra, R., & Arbaugh, F. (2007). *Missouri Department of Higher Education Improving Teacher Quality Grants Cycle 4 external evaluation report*. Columbia, MO: Southwestern Bell Science Education Center, University of Missouri-Columbia.

Abell, S., Ehlert, M., Lannin, J., Marra, R., Cole, J., & Arbaugh, F. (2006). *Missouri Department of Higher Education Improving Teacher Quality Grants Cycle 3 external evaluation report*. Columbia, MO: Southwestern Bell Science Education Center, University of Missouri-Columbia.

Refereed Conference Presentations

International Refereed Presentations

McGraw, R., Arbaugh, F., Lynch, K., & Brown, C. A. (2003). Mathematics teacher professional development as the development of communities of practice. Twenty-seventh Conference

of the International Group for the Psychology of Mathematics Education held jointly with the Twenty-fifth Conference of PME-NA Honolulu, HI. July 2003.

Arbaugh, F., Brown, C. A., & McGraw, R. (2003). The messy work of professional development: The conversation continues. Twenty-seventh Conference of the International Group for the Psychology of Mathematics Education held jointly with the Twenty-fifth Conference of PME-NA Honolulu, HI. July 2003.

National Refereed Presentations

Freeburn, B., Arbaugh, F., Karunakaran, S., & Konuk, N. (Accepted). Improving preservice mathematics teachers' generic example proof capability. National Council of Teachers of Mathematics Research Conference. New Orleans, LA.

Arbaugh, F., Breyfogle, L., Langrall, C., Lloyd, G. M., & Smith, M. S. (2013, January). Publishing research in mathematics education for diverse audiences. Association of Mathematics Teacher Educators (AMTE) Annual Conference. Orlando, FL.

Smith, M. S., Arbaugh, F. (2013, January). What teachers need to know and be able to do to engage students in reasoning-and-proving. Association of Mathematics Teacher Educators (AMTE) Annual Conference. Orlando, FL.

Smith, M.S., Arbaugh, F., Steele, M., Boyle, J., Konuk, N., & Gordon, E. (2012, April). Developing Teachers' Capacity to Support Students' Reasoning and Proving. Research Pre-session of the Annual Meeting of the National Council of Teachers of Mathematics. Philadelphia, PA.

Lannin, J., Chval, K.B., Arbaugh, F., Langrall, C., Taylor, C., Webb, M., Hicks, S., Bruton, R. (2012, April). Investigating secondary mathematics teacher PCK across the professional continuum. Research Pre-session of the Annual Meeting of the National Council of Teachers of Mathematics. Philadelphia, PA.

Arbaugh, F., Taylor, C., Bruton, R., Chval, K.B., Webb, M. (2012, April). Examining expert secondary mathematics teachers' thinking about mathematics instruction. Annual Meeting of the American Educational Research Association. Vancouver, BC.

Arbaugh, F., & Smith, M. S. (2012, February). Developing teachers' pedagogical practices for reasoning-and- proving: Learning to modify textbook tasks. Association of Mathematics Teacher Educators (AMTE) Annual Conference. Fort Worth, TX.

Arbaugh, F., Asturias, H., Cuoco, A., Mill, V. (2011, April). Research opportunities arising from the standards for mathematical practice. Research Pre-session of the Annual Meeting of the National Council of Teachers of Mathematics. Indianapolis, IN.

- Steele, M., Arbaugh, F., & Boyle, J. (2011, April). Enhancing the reasoning-and-proving content of textbook tasks: A site for teacher professional development. Annual Meeting of the National Council of Supervisors of Mathematics. Indianapolis, IN.
- McCloskey, A., Arbaugh, F., Lloyd, G. (2011, January). Student teachers and their mentors in mathematics teacher education: Preliminary findings from a research study. Association of Mathematics Teacher Educators (AMTE) Annual Conference. Irvine, CA.
- Arbaugh, F., Marra, R., Abell, S., Lannin, J. K., Cheng, Y., Gagnon, M., Merle, D., & Smith, R. (2010, May). The impact of evaluation on professional development design and implementation. Annual Meeting of the American Educational Research Association. Denver, CO.
- Arbaugh, F., Herbal-Eisenmann, B., Knuth, E., Kranendonk, H., & Ramirez, N. (2010, April). NCTM research agenda conference report. Research Pre-session of the Annual Meeting of the National Council of Teachers of Mathematics. San Diego, CA.
- Arbaugh, F., Lannin, J. K., Chval, K. (2010, April). Delineating the PCK of beginning secondary mathematics teachers. Research Pre-session of the Annual Meeting of the National Council of Teachers of Mathematics. San Diego, CA.
- Lloyd, G., Bannister, V., Arbaugh, F., Herbel-Eisenmann, B., Drake, C., & Land, T. J. (2010, January). K-12 textbooks and curriculum materials as tools in mathematics teacher education. Association of Mathematics Teacher Educators Annual Conference, Irvine, CA.
- Masingila, J., Chazan, D., Dollard, C. D., & Arbaugh, F., (2010, January). Framings for secondary mathematics teacher education programs. Association of Mathematics Teacher Educators Annual Conference, Irvine, CA.
- Arbaugh, F., Quander, J., Barnes, D., & Findell, B. (2009, April). NCTM research agenda conference: Where do we go from here? Annual Meeting of the National Council of Teachers of Mathematics (NCTM), Washington, DC.
- Quander, J., & Arbaugh, F. (2009, April). Collaborating to identify research priorities in math education. Research Pre-session of the Annual Meeting of the National Council of Teachers of Mathematics (NCTM), Washington, DC.
- Smith, M. S., & Arbaugh, F. (2009, April). Developing teachers' capacity to engage students in reasoning and proving activities. Annual Meeting of the National Council of Supervisors of Mathematics. Washington, DC.
- Boone, W. J., Abell, S. K., Volkmann, M. J., Arbaugh, F., & Lannin, J. (2009, April). The development and utilization of a standards-based instrument to evaluate the perceived preparedness of science and mathematics teachers in an alternative certification program. National Association for Research in Science Teaching, Garden Grove, CA.

- Arbaugh, F., Chval, K., Jackson, C., Webb, M., & Regis, T. (2009, April). The growth of mathematics teachers' knowledge related to instruction. Annual Conference of the American Educational Research Association, San Diego, CA.
- Marra, R. M., Arbaugh, F., Lannin, J., Abell, S., Ehlert, M., Smith, R., Merle, D., & Park Rogers, M. (2009, April). Orientations to professional development design and implementation: Understanding their relationship to PD outcomes across multiple projects. Annual Conference of the American Educational Research Association, San Diego, CA.
- Arbaugh, F., Smith, M. S., Steele, M., & Taylor, C. (2009, February). Cases of reasoning and proving (CORP): Materials for secondary mathematics teacher education. Association of Mathematics Teacher Educators Annual Meeting, Orlando, FL.
- Chval, K.B., Arbaugh, F., & Lannin, J.K (2009, February). The dilemma of the launch: Why is it so difficult for mathematics teachers? Association of Mathematics Teacher Educators, Orlando, FL.
- Lannin, J. K., Abell, S., Arbaugh, F., Chval, K., Friedrichsen, P., & Volkmann, M. J. (2008, March). Researching teacher knowledge: Further delineating the PCK construct for science and mathematics education. American Educational Research Association Annual Meeting, New York, NY.
- Barker, D. D., Lannin, J. K., Townsend, B. E., Martin, T. S., & Arbaugh, F. (2008, March). Teachers' knowledge of algebraic generalization: Its organization for instruction. American Educational Research Association Annual Meeting, New York, NY.
- Park Rogers, M., Abell, S., Arbaugh, F., Cole, J., Hutchins, K. & Marra, R. (2008, March). Multiple approaches to science teacher professional development: What are they and how do teachers respond? American Educational Research Association Annual Meeting, New York, NY.
- Chval, K. B., Lannin, J. K., & Arbaugh, F., (2008, January). The PCK of beginning mathematics teacher educators. Association of Mathematics Teachers Educators Annual Meeting, Tulsa, OK.
- Arbaugh, F., Lannin, J. K., Chval, K., Regis, T., Pomerence, S., & Appova, A. (2007, March). Using lesson planning and video analysis as data collection tools for assessing PCK. Research Pre-session of the Annual Meeting of the National Council of Teachers of Mathematics, Atlanta, GA.
- Lannin, J. K., Chval, K., Arbaugh, F., Appova, A., Nivens, R., Olson, T., Pomerence, S., & Regis, T. (2007, January). Studying alternative certification in mathematics: A tale of two research projects. Association for Mathematics Teachers Educators Annual Meeting, Irvine, CA.

- Arbaugh, F., & Appova, A., (2007, January). Examining the role of the university mathematics teacher educator. Association for Mathematics Teachers Educators Annual Meeting, Irvine, CA.
- Arbaugh, F., Abell, S., Lannin, J., Volkmann, M., & Boone, W. (2006, April). Investigating alternative certification internship models in mathematics and science teacher education. American Educational Research Association Annual Meeting, San Francisco, CA.
- Arbaugh, F., Lannin, J., Jones, D. L., & Barker, D. (2006, January). Using pedagogical thinking as a lens to study teacher change. Association for Mathematics Teachers Educators Annual Meeting, Tampa, FL.
- Lambdin, D. V., Morge, S., & Arbaugh, F. (2006, January). What can teachers learn from the National Assessment of Educational Progress (NAEP)? Association for Mathematics Teachers Educators Annual Meeting, Tampa, FL.
- Boone, W., Abell, S., Volkmann, M., Arbaugh, F., & Lannin, J. (2006, January). Perceived preparedness of science and mathematics teachers in an alternative certification program: Implications for faculty and students. The Annual Meeting of the Association for Science Teacher Education, Portland, OR.
- Arbaugh, F. (2005, October). Inservice teacher education: Investigating mathematics' teachers professional growth. The Annual Meeting of the North American Chapter of Psychology of Mathematics Education. Roanoke, VA.
- Arbaugh, F., Lannin, J., Jones, D. L., & Barker, D. (2005, October). Curriculum-specific professional development: A phenomenographical study of teachers' perceptions. The Annual Meeting of the North American Chapter of Psychology of Mathematics Education. Roanoke, VA.
- Friedrichsen, P., Lannin, J., Arbaugh, F., Volkmann, M., & Abell, S. (2005, April). Professional identities: Implications for alternative certification programs in mathematics and science. American Educational Research Association Annual Meeting, Montreal.
- Volkmann, M., Arbaugh, F., Scribner, J., Friedrichsen, P., Lannin, J., & Abell, S. (2005, April). Defining highly qualified teachers among teacher certification students: A real Paige turner. American Educational Research Association Annual Meeting, Montreal.
- Abell, S., Arbaugh, F., Boone, W., Volkmann, M., & Lannin, J. (2005, January). Field-based internship models for alternative certification: Views of interns, mentors, and university science educators. Association for the Education of Teachers of Science Annual Meeting, Colorado Springs, CO.
- Lannin, J., Arbaugh, F., Jones, D., & Rogers, M. (2005, January). Differentiating instructional practices in *Core-Plus* classrooms. Association for Mathematics Teachers Educators Annual Meeting, Dallas, TX.

- Arbaugh, F., Lambdin, D., Lynch, K., & Morge, S. (2005, January). NAEP Professional development materials. Association for Mathematics Teachers Educators Annual Meeting, Dallas, TX.
- McGraw, R., Arbaugh, F., Lynch, K., & VanZoest, L. (2004, April). Studying teacher development through the theoretical lenses of community and identity. Research Pre-session of the Annual Meeting of the National Council of Teachers of Mathematics, Philadelphia, PA.
- Abell, S., Boone, W., Beilfuss, M., Volkmann, M., Demir, A., Arbaugh, F., & Lannin, J. (2004, January). Recruiting future science and mathematics teachers in alternative certification programs: Strategies tried and lessons learned. Association for the Education of Teachers in Science Annual Meeting, Nashville, TN.
- Lannin, J., Arbaugh, F., Abell, S., Volkmann, M., & Boone, W. (2004, January). Meeting the challenges: Designing and implementing a post-baccalaureate program for mathematics and science teachers. Association of Mathematics Teacher Educators Annual Meeting, San Diego, CA.
- Reys, B., & Arbaugh, F. (2003, April). Middle school mathematics texts: What's all the fuss? National Council of Teachers of Mathematics Annual Meeting, San Antonio, TX.
- Abell, S., Volkmann, M., Arbaugh, F., Lannin, J., Boone, B. (2003, February). Designing a post-baccalaureate program for the recruitment and retention of science and mathematics teachers. Association for the Education of Teachers of Science annual meeting, St. Louis, MO.
- Arbaugh, F., Brown, C. A., & McGraw, R. (2002, October). The messy work of professional development: The conversation continues. Discussion session at the Twenty-fourth annual meeting of the North American chapter of the International Group for the Psychology of Mathematics Education (PME-NA), Athens, GA.
- Brown, C. A., McGraw, R., Koc, Y., Lynch, K., & Arbaugh, F. (2002, October). Lesson study in secondary mathematics. Paper presentation at the Twenty-fourth annual meeting of the North American chapter of the International Group for the Psychology of Mathematics Education, Athens, GA.
- Arbaugh, F., & Brown, C. A. (2002, April). Influences of the Mathematics Tasks Framework on high school mathematics teachers' knowledge, thinking, and teaching. Paper presented at the American Educational Research Association Annual Meeting, New Orleans, LA.
- Arbaugh, F., & Bay-Williams, J. (2002, January). Designing mathematics methods courses using *Principles and Standards for School Mathematics* as a primary text. The Association of Mathematics Teacher Educators Sixth Annual Conference, San Antonio, TX.

Brown, C. A., Arbaugh, F., Allen, A., & Koc, Y. (2001, April). Mathematics teachers' use of common planning time. American Educational Research Association Annual Meeting, Seattle, WA.

Brown, C. A., Arbaugh, F., Lutz, M., & McGraw, R. (2001, April). Studying professional development is messy work. What are the research issues? Research Pre-session of the National Council of Teachers of Mathematics Annual Meeting, Orlando, FL.

Smith, M., Stein, M. K., Arbaugh, F., Henningsen, M., McGraw, R., Wilson, M., & Zawojewski, J. (2000, February). Cases in mathematics teacher education: What do teachers learn from these experiences? Association of Mathematics Teacher Educators Annual Conference, Charlotte, NC.

McGraw, R., & Arbaugh, F. (2000, April). Problem solving with the Geometer's Sketchpad. National Council of Teachers of Mathematics Annual Meeting, Chicago, IL.

Arbaugh, F. & Beckner, E. (1999, April). You (and your students) can do it! Algebraic thinking activities for your K- 5 classroom. National Council of Teachers of Mathematics Annual Meeting, San Francisco, CA.

Regional and State Refereed Presentations

Arbaugh, F. (2012, May). Focus on reasoning-and-proving with secondary pre-service mathematics teachers. Presentation at the Annual Symposium of the Pennsylvania Association of Mathematics Teachers Educators (PAMTE). Shippenburg, PA.

Arbaugh, F. (2008, December). Principles of effective instruction. Presentation at the annual Missouri Council of Teachers of Mathematics Conference, Columbia, MO.

Lannin, J.K., & Arbaugh, F. (2005, December). Transitioning to teaching: Perspectives of first-year elementary, middle, and secondary teachers. Presentation at the annual Missouri Council of Teachers of Mathematics Conference, Columbia, MO.

Arbaugh, F., & Jones, D. L. (2003, December). Rewriting test questions: Strategies for making math tests more meaningful. Annual meeting of the Missouri Council of Teachers of Mathematics. Columbia, MO.

Arbaugh, F., & Bay-Williams, J. (2003, May). Exploring standards-based middle school curricula through the algebra strand. 2003 Green Lakes Conference sponsored by the Wisconsin Mathematics Council, Green Lakes, WI.

Arbaugh, F. et al. (2002, December). Bungie Barbie and kamakazi Ken: A data collection and analysis activity. Annual meeting of the Missouri Council of Teachers of Mathematics, Columbia, MO.

Invited Presentations

National Invited Presentations

- Arbaugh, F. (2014, April). Three principles of effective mathematics instruction. National Council of Teachers of Mathematics (NCTM) Annual Meeting. New Orleans, LA.
- Arbaugh, F. (2014, April). Supporting teachers to enact three principles of effective mathematics instruction. National Council of Supervisors of Mathematics (NCSM) Annual Meeting. New Orleans, LA.
- Arbaugh, F., Clark, L., Vavasseur, C., & Pounder, D. (2014, March). Preparing teacher candidates for CCSS in mathematics: Implications for teacher education programs, pedagogy and practice. Major Forum at the American Association of Colleges of Teacher Education (AACTE) Annual Conference. Indianapolis, IN.
- Arbaugh, F., (2013, April). Get your students to reason more in math class. Kickoff Session Speaker, Learn/Reflect Strand, National Council of Teachers of Mathematics (NCTM) Annual Meeting. Denver, CO.
- Arbaugh, F., & Chval, K. B. (2013, April). Supporting the transition from experienced teacher to mathematics coach. National Council of Supervisors of Mathematics (NCSM) Annual Meeting. Denver, CO.
- Abell, S., Arbaugh, F., Chval, K., Friedrichsen, P., Lannin, J., & Volkmann, M. J. (2006, May). Research on alternative certification: Where do we go from here? STEM-ACT Conference on Alternative Certification of Science Teachers, Arlington, VA.
- Arbaugh, F., & Bay-Williams, J. (2003, January). Using standards-based curriculum materials in the preparation of teachers. The Pre-Conference of the Association of Mathematics Teacher Educators Seventh Annual Conference, Atlanta, GA.
- Arbaugh, F., & Bay-Williams, J. (2002, April). Fostering a successful implementation: Helpful strategies for supporting teachers and building community support. Show-Me Conference 2002, Atlanta, GA.
- Arbaugh, F. (2001, May). NCTM's *Principles and Standards for School Mathematics*: Messages for grades 6-8. Show-Me Conference 2001, St. Louis, MO.
- Brown, C., & Arbaugh, F. (2001, April). Lesson study in secondary mathematics: Professional development through lesson development. National Council of Supervisors of Mathematics Annual Meeting, Orlando, FL.
- Reys, B., & Arbaugh, F. (2001, April). Professional development alternatives for middle school mathematics teachers. National Council of Teachers of Mathematics Presidential Awardees' Annual Meeting, Orlando, FL.

Regional and State Invited Presentation

- Arbaugh, F. (2013, November). Think math!! Keynote presentation at the annual meeting of the Pennsylvania Council of Teachers of Mathematics (PCTM), Seven Springs Resort, PA.
- Arbaugh, F. (2013, September). Who *is* Responsible for Teacher Learning? Keynote presentation at the Texas Council of Teachers of Mathematics (AMTE-TX) Conference, Houston, TX.
- Arbaugh, F. (2013, May). Who's responsible for teacher learning? Keynote presentation at the annual symposium of the Pennsylvania Association of Mathematics Teacher Educators (PAMTE), Shippenburg, PA.
- Arbaugh, F. (2010, December). Fran's Top 5: Get your students reasoning more in math class. Keynote presentation at the Annual Conference of the Missouri Council of Teachers of Mathematics (MCTM), Columbia, MO.
- Arbaugh, F. (2010, May). Introducing AMTE's new journal: How can we become involved? Keynote presentation at the annual symposium of the Pennsylvania Association of Mathematics Teacher Educators (PAMTE), Shippenburg, PA.
- Arbaugh, F., & Bay-Williams, J. (2005, February). Assessment and problem solving go hand in hand. ACCLAIM Pre-service Conference. Morehead, KY.
- Arbaugh, F. (2004, September). Considering levels of cognitive demand: A framework for engaging preservice teachers in analyzing the relationship between types of mathematical tasks and student reasoning. Mathematics Teacher Preparation in Appalachia: Third Annual Conference. Huntington, WV.
- Arbaugh, F. (2003, February). Professional development and partnerships: Making it work. Keynote address at the 2003 Missouri Mathematics Leadership Conference. Lake Ozark, MO.
- Reys, B. & Arbaugh, F. (2003, January). Choosing middle school mathematics curricula: What are the issues? Parkway School District 6-8 Mathematics Teacher Workshop.
- Arbaugh, F., & Jones, D. L. (2002, August). The great divide: Issues to consider when choosing a middle school mathematics curriculum. Webster Groves School District 6-8 Math Selection Workshop.
- Arbaugh, F., & Bay-Williams, J. (2002, July). Fostering a successful implementation: Helpful strategies for supporting teachers and building community support. Annual Meeting of the Indiana Council of Teachers of Mathematics, Indianapolis, IN.
- Reys, B., & Arbaugh, F. (2002, July). Middle School Mathematics Reform: Where are we? Where do we need to go? How do we get there? Annual Meeting of the Indiana Council of Teachers of Mathematics, Indianapolis, IN.

Arbaugh, F. (2002, June). Do textbooks matter? Northern Arizona University Curriculum Showcase. Flagstaff, AZ.

Townsend, M., Monnier, N., Arbaugh, F., Iosevich, A. (2002, February). Developing WI courses. Teaching Renewal Conference, University of Missouri-Columbia.

Arbaugh, F., & Bay-Williams, J. (2002, January). NSF-sponsored middle-school mathematics curricula. Session sponsored by the Rhode Island Department of Education, Rhode Island College, Providence, RI.

Arbaugh, F. (2001, April). Standards-based middle school mathematics curriculum materials – What makes it work? (Breakout session). Missouri Mathematics Leadership Conference, Lake Ozark, MO.

External and Internal Funding

External

Pending

National Science Foundation. Developing tools for high-leverage and ambitious practices for the integrated teaching of mathematics and science. Submitted December 6, 2013. PI: Scott McDonald. Co-PI: Fran Arbaugh. Total requested: \$1,995,992.

Funded

National Science Foundation through a subcontract from the University of Pittsburgh. Cases of Reasoning and Proof in Secondary Mathematics (CORP). PSU PI/Co-director: Fran Arbaugh. September 1, 2007-August 31, 2012. Total subcontract award: ~\$400,000.

National Science Foundation. Supporting Career Changers to Become Mathematics and Science Teachers in Missouri (Supplemental Request). PI: Sandra Abell. Co-PIs: Fran Arbaugh, Mark Volkmann. Total award: \$98,866.

National Science Foundation. MU Noyce Scholars Program for Science and Mathematics Teachers. PI: Sandra Abell. Co-PIs: Fran Arbaugh, Oscar Chavez, Mark Volkmann, John Adams (Chemistry), Carol Wicks (Geological Sciences). Total award: \$498,020.

Missouri Department of Higher Education. Evaluation of Cycles 4-8 Professional Development Projects. PI: Sandra Abell. Co-PIs: Fran Arbaugh, John Lannin, Rose Marra (SISLT), Mark Ehlert (Economics). August 2005-November 2011. \$190,000 per cycle, Total award: \$950,000. (www.pdeval.missouri.edu)

National Science Foundation. Researching Science and Mathematics Teacher Learning in Alternative Certification Models. PI: Sandra Abell. Co-PIs: Fran Arbaugh, Kathryn Chval, Pat Friedrichsen, John Lannin, Mark Volkmann. June 1, 2006 – May 31, 2011. Total award: \$1,947,207.

National Science Foundation. Supporting Career Changers to Become Mathematics and Science Teachers. PI: Sandra Abell. Co-PIs: Fran Arbaugh, John Lannin, Mark Volkmann, Meera Chandrasekhar (Physics), Jan Weaver (Biology), Mary Laffey (Columbia Public Schools -- CPS). September 1, 2003 – August 31, 2007. Total award: \$494,569.

National Science Foundation. Getting to the Core: Supporting Teachers' Implementation of *Contemporary Mathematics in Context*. PI: Fran Arbaugh. July 1, 2002 - June 30, 2004. No-cost extension year ended September 30, 2005. Total award: \$199,682.

National Science Foundation. Science and Mathematics Academy for the Recruitment and Retention of Teachers (SMAR²T). PI: Sandra Abell. Co-PIs: Fran Arbaugh, John Lannin, Mark Volkmann, Meera Chandrasekhar (Physics), Jan Weaver (Biology), Mary Laffey (CPS). June 1, 2002 – May 31, 2006. Total award: \$872,690.

National Science Foundation. Show-Me Project II. PI: Barbara Reys. Co-PIs: Fran Arbaugh, Ira Papick (Math), Robert Reys. September 1, 2002- August 31, 2005. No cost extension approved through August 2007. Total award: ~ \$5,100,000.

Missouri Coordinating Board for Higher Education. GEAR UP Missouri Professional Development II. PI: Fran Arbaugh. January 2002-December 2002. Total award: \$8,715.

Missouri Coordinating Board for Higher Education. GEAR UP Missouri Professional Development I. PI: Fran Arbaugh. May 2001-December 2001. Total award: \$8715.

National Science Foundation. Enhancing Leadership for Middle School Science (ELMSS). PI: Sandra Abell. External Evaluator: Fran Arbaugh. February 2002-May 2003. Total award: \$199,815.

National Science Foundation. Show-Me Project. PI: Barbara Reys. Co-PIs: John Beem (Math), Ira Papick (Math), Robert Reys. Consultant: Fran Arbaugh. January 2001-August 2002. Total Award: \$6,000,000.

Not Funded

National Science Foundation. Bridging the gap between teacher learning and effective classroom practices: A professional development model for enhancing reasoning-and-proving in secondary mathematics. PI: Fran Arbaugh. Co-PIs: Gwendolyn Lloyd, Andrea McCloskey, Scott McDonald, Margaret (Peg) Smith. Submitted December 6, 2012. Total Requested = \$2,857,774. Reviewed as “highly competitive” in 2013.

National Science Foundation. Bridging the gap between teacher learning and effective classroom practices: A professional development model for enhancing reasoning-and-proving in secondary mathematics. PI: Fran Arbaugh. Co-PIs: Lynn Breyfogle, Gwendolyn Lloyd, Andrea McCloskey, Scott McDonald, Margaret (Peg) Smith. Submitted January 10, 2012. Total Requested = \$2,999,990. Reviewed as “highly competitive” in 2012.

National Science Foundation. Improving Mathematics and Science Teaching and Learning Through Discourse: A Model of Professional Development for K-12 Mathematics and Science Mentors and Their Mentees. PI: Fran Arbaugh. Co-PIs: Bernard Badiali, Gwen Lloyd, Andrea McCloskey, Scott McDonald, Jim Nolan, Carla Zemal-Saul. Submitted January 6, 2011. Total Requested = \$3,465,276.

National Science Foundation. Supporting Undergraduate Mathematics Teacher Education through Preparing Future Faculty. PI: Kathryn Chval. Co-PIs: Fran Arbaugh, John Lannin. Total requested: ~\$150,000.

National Science Foundation through a subcontract from the University of Pittsburgh. Cases of Reasoning and Proof in Secondary Mathematics. Co-director: Margaret (Peg) Smith, University of Pittsburgh. Subcontract/MU PI: Fran Arbaugh. Total Award to MU = \$350,213. Reviewed as “competitive” in 2006. Not funded.

National Science Foundation. Assessment-Driven Professional Development: Supporting and Studying Mathematics Teachers’ Professional Growth. PI: Fran Arbaugh. Co-PIs: John Lannin, James Tarr, and Chip Sharp (CPS). Total Requested: \$2,287,669 for 5 years. Reviewed as “high priority” in 2005. Not funded.

National Science Foundation. Partners for Enhancing Teaching and Learning of Mathematics. PI: Fran Arbaugh. Co-PIs: John Lannin, Linda Coutts (CPS), Dennis Sentille (Math), Chip Sharp (CPS), Debra Perkowski (Westminster College). Total amount requested: \$6,503,683 for 5 years. Reviewed as “competitive” in 2002. Not funded.

Internal

Funded

PSU College of Education RIG. Student Teachers and Their Mentors in the Practices of Mathematics Teacher Education. PI: Andrea McCloskey. Co-PIs: Fran Arbaugh and Gwen Lloyd. Total Award: RIG \$17,541; C&I: \$14,137; Arbaugh Start-up Funds: \$3,000. Awarded January 2010. Project dates: August 2010-May 2011.

Not funded

UM Research Board. Implementation Leadership for *Connected Mathematics Project*. PI: Fran Arbaugh. Co-PI: Brendan Maxcy (ELPA). Total Award = \$44,671. Submitted February 1, 2006. Not funded.

MU Research Council. Establishing Institutional Competence: A Study of Leadership Practices Enabling the Implementation of the Connected Mathematics Project. PI: Fran Arbaugh. Co-PI: Brendan Maxcy (ELPA). Total Award = \$7,396. Submitted February 13, 2006. Not funded.

Editorial and Review Work

Editorships

Co-Editor. *Journal of Teacher Education*. Association of American Colleges of Teacher Education (AACTE). August 2010-July 2015.

Editorial Panel Member. *Cases in Mathematics Teacher Education: Tools for Developing Knowledge Needed for Teaching*. Association of Mathematics Teacher Educators (AMTE) Monograph Series, Volume 4. January 2006-February 2008.

Editorial Panel Member. *The Work of Mathematics Teacher Educators: Exchanging Ideas for Effective Practice*. Association of Mathematics Teacher Educators (AMTE) Monograph Series, Volume 3. January 2005-September 2007.

Co-Editor. “Supporting Teacher Learning” Department, *Teaching Children Mathematics*. Fall 2004-Fall 2006.

Additional Review Work

Manuscript Reviewer. *Mathematics Teacher Educator (MTE)*. August 2013 – present.

Manuscript Reviewer. *Journal of Mathematics Teacher Education (JMTE)*. July 2003-present.

Manuscript Reviewer. *Journal for Research in Mathematics Education (JRME)*. April 2003 – present.

Manuscript Reviewer. *Mathematics Teacher (MT)*. Fall 2001-present.

NCTM Research Pre-session Proposal Reviewer. Fall 2010.

Research Presentation Proposal Reviewer. American Educational Research Association: Division K. September 2005.

Book Revision Reviewer. Reviewed [McNamara, T. J. (2003). *Key concepts in mathematics: Strengthening standard practice in grades 6-12*. Glenview, IL: Pearson Publishing.] and supplied extensive revision suggestions. August 2005.

Research Presentation Proposal Reviewer. Psychology of Mathematics Education – North American Chapter 2002 Annual Meeting.

Research Presentation Proposal Reviewer. SIG/RME sessions for American Educational Research Association Annual Meeting. August 2001, 2012

Journal Evaluator. *Mathematics Teaching in the Middle School*. February 2002 issue.

Manuscript Reviewer. Reviewed the pre-publication copy of: Danielson, C., & Marquez, E. (1998). *A collection of performance tasks and rubrics: High school mathematics*. Larchmont, NY: Eye on Education, Inc. (Summer 1997).

Professional Service

President, Association of Mathematics Teacher Educators (AMTE), February 2013-February 2015.

President-Elect, Association of Mathematics Teacher Educators (AMTE), February 2012-February 2013.

Advisory Board Member, Association of Public Land-Grant Universities (APLU) Science and Mathematics Teacher Imperative (SMTI) Mathematics Teacher Education Partnership (MTEP), May 2013-February 2015.

External Evaluator: *RtI in Mathematics: Collaborating to Make a Difference*. An NSF funded project to the Council for Exceptional Children (CEC) and the National Council for Teachers of Mathematics (NCTM).

Advisory Committee Member, “Mathlanding: Resources and Tools for Elementary Math Specialists and Teachers.” Maryland Public Television. Summer 2011-present.
Member, *Common Core State Standards – Mathematics Task Force*, Association of Mathematics Teacher Educators (AMTE). August 2011-present.
2012 – 1 Promotion and Tenure External Review Letter
2011 – 5 Promotion and Tenure External Review Letters
2010 – 3 Promotion and Tenure External Review Letters
Member, Board of Directors. Association of Mathematics Teacher Educators (AMTE). January 2007-January 2010.
Facilitator, Columbia Public Schools Secondary Mathematics Taskforce. September 2006-May 2007.
Judge, Missouri submissions for the Presidential Awards for Excellence in Mathematics and Science Teaching, June 2006.
Member, Advisory Board for the 2006 Missouri Preservice Mathematics Teacher Conference. September 2005-April 2006.
Member, Program Committee for the 2005 Annual Meeting of the Association of Mathematics Teacher Educators (AMTE).
Member, Local Advisory Board for the Center for the Study of Mathematics Curriculum (CSMC). June 2004-May 2007.
Member, Membership Committee. Association of Mathematics Teacher Educators (AMTE). February 2002-January 2006.
Contest Judge, Missouri 7th and 8th Grade Mathematics. Hickman High School. April 2001.
Assistant Curriculum Developer, National Council of Teachers of Mathematics Standards 2000 Web Development Team. June 1999 - April 2000.
Problem Developer. Developed and contributed problems for the October 1999 Mathematics Teacher monthly calendar of daily mathematics problems for high school teachers.
Assistant External Evaluator, Indiana Mathematics Initiative (IMI). Fall 1997 - Spring 1999.

University Service

Penn State University

PSU Campus

College of Education Representative, Freshman Convocation, August 25, 2012.

PSU College of Education

Member, Promotion and Tenure Committee. August 2011-August 2014.

Member, Mathematics Education Faculty Search Committee, Penn State Erie, The Behrend College, Fall 2011

Member, Faculty PI Interview Team. Director of Contracts Search. Fall 2010

Peer Evaluation of Teaching: Deidre O’Sullivan (2011)

PSU Department of Curriculum & Instruction

Program Coordinator, Mathematics Education, August 2013-present.

Chair, Staff Search Committee. November - December 2013.

Director, Secondary Education Program. July 2011-October 2012.

Member, Promotion and Tenure Committee. August 2010-August 2011.

Department Representative, COE Faculty Council. August 2010-August 2013.
Peer Evaluation of Teaching: Deb Smith (2010); Matt Poehner (2012); Andrea McCloskey (2012); Bernard Badiali (2012); Scott McDonald (2013)

University of Missouri

MU Campus

Discussion facilitator at “Expectations for Teaching and Learning: A Student-Faculty Dialogue.” Fall 2005.
Faculty Writing Across the Curriculum Seminar. Fall 2001.
Homecoming Talent Show Judge. Fall 2001.

MU College of Education

Curriculum Committee Member. Fall 2002- Fall 2003.
Presenter Graduate Scholarship and Recognition Ceremony. 2001, 2002, 2003, 2004.

MU Department of Learning, Teaching, and Curriculum

LTC Awards Committee Chair. Fall 2006 - present.
Teaching Fellows Comprehensive Exam Evaluator. June 2005.
LTC Ad Hoc Mentoring Committee member. May 2004 – present.
LTC Awards Committee Member. January 2002 – August 2004. Chair: Fall 2002 – August 2004.
LTC Connections Work Group. September 2001-May 2002.

MU Mathematics Education Program

Faculty Co-Sponsor. University of Missouri Mathematics Teacher Organization (UM²TO).
Fall 2001 – Winter 2006.
Search Committee for Mathematics Education. January 2001.
NCATE/DESE website materials preparation. Fall 2002 – Fall 2003.
NCATE Learned Society (NCTM) Materials preparation. Fall 2001.
Participant in UM Mathematics Education Doctoral Collaborative. Winter 2001 – Winter 2002.

Organizational Memberships

American Education Research Association (AERA) including Special Interest Group/Research in Mathematics Education (SIG/RME) and Division K
Association of Mathematics Teacher Educators (AMTE)
National Council of Supervisors of Mathematics (NCSM)
National Council of Teachers of Mathematics (NCTM)
Pennsylvania Association of Mathematics Teacher Educators (PAMTE)