

1. PERSONAL DATA

Barbara M. Moskal

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2. EDUCATION

Doctorate in Mathematics Education (1997), University of Pittsburgh, Pittsburgh, PA.

Dissertation examined the information that middle school mathematics teachers acquired and used as they incorporated written open-ended decimal tasks into their classrooms. Degree includes a minor in Quantitative Research Methodology. Advisor: Dr. Ellen Ansell, University of Pittsburgh.

Masters of Arts in Mathematics (1991), University of Pittsburgh, Pittsburgh, PA.

Coursework in both pure and applied mathematics.

Bachelor of Science in Mathematics Education (1989), Duquesne University, Pittsburgh, PA.

Student teacher in a public city high school which included instruction for both remedial and gifted students.

3. EMPLOYMENT HISTORY

Interim Director of the Trefny Institute for Educational Innovation, Colorado School of Mines (Nov. 2010-present). Responsibilities: oversight of Institute budget and activities.

Professor, Department of Mathematical and Computer Sciences, Colorado School of Mines (April 2008- present). Responsibilities: research, service and teaching.

Director of the Center for Assessment of Science, Technology, Engineering and Mathematics, Colorado School of Mines (January 2007 – present). Responsibilities: oversight of center, strategic planning and fund raising.

Associate Professor, Department of Mathematical and Computer Sciences, Colorado School of Mines (August 2004 – August 2008). Responsibilities: research, service and teaching.

Assistant Professor, Department of Mathematical and Computer Sciences, Colorado School of Mines (August 1999 - May 2004). Responsibilities: research, service and teaching.

Lecturer, Department of Mathematical and Computer Sciences, Colorado School of Mines (August 1997 - August 1999). Responsibilities: teaching and service.

Associate Director for the Center for Engineering Education (CEE), Colorado School of Mines (December 1999 - December 2002). Responsibilities: fund raising, establishment of bylaws, publicizing center, website developer and member of executive board.

Adjunct Faculty, Department of Mathematics and Computer Science, Duquesne University (August 1995 - May 1997). Responsibilities: taught courses in mathematics and computer science.

Adjunct Faculty, Department of Mathematics, University of Pittsburgh (August 1995 - May 1997). Responsibilities: taught courses in mathematics.

Instructor, Sylvan Learning Center, Pittsburgh (May 1989 - December 1996). Responsibilities: taught mathematics to students grades K-12.

Graduate Research Assistant for Quantitative Understanding: Amplifying Student Achievement and Reasoning (QUASAR) research project, University of Pittsburgh (May 1991 - August 1995). Responsibilities: team development of assessments and completion of analyses for a K-12 outreach program.

Graduate Teaching Assistant, Department of Mathematics, University of Pittsburgh (September 1989 - May 1991). Responsibilities: taught entry level college mathematics courses.

Full-time Substitute, Mathematics, North Catholic High School, Pittsburgh (March 1989 - June 1989). Responsibilities: taught high school level mathematics courses.

Instructor Assistant, Sylvan Learning Center, Pittsburgh (October 1985 - May 1989). Responsibilities: provided one-on-one tutoring to students, maintained the instructional materials, maintained student records and provided general support to the teachers.

4. MEMBERSHIP IN PROFESSIONAL SOCIETIES

American Educational Research Association (AERA), American Society for Engineering Education (ASEE), Colorado Council of Teachers of Mathematics (CCM), Institute of Electrical and Electronics Engineers (IEEE), Mathematical Association of America (MAA), National Council on Measurement in Education (NCME), National Council of Teachers of Mathematics (NCTM), Sigma Xi.

5. PROFESSIONAL ACTIVITIES AND SERVICES

Materials Research Society, 2010-2011, Member of Special Task Force on Information and Tools for Education Transfer.

Member of Organizing Team for the National Meeting on STEM Concept Inventories, 2010, Alexandria, VA.

Review of Promotion Materials, 2009

- University of Michigan, recommendation for promotion to Associate Research Professor.
- George Mason, recommendation for promotion to Associate Professor with Tenure.

Chair for regional meeting, Rocky Mountain Section of the Mathematical Association of America, Regional Meeting, 2009.

Member of the Awards Committee for the Rocky Mountain Section of the Mathematical Association of America, 2007.

Associate Editor, Journal of Engineering Education, 2009-present.

Member of Editorial Board for Educational Measurement: Issues and Practice, 2006-present.

Member of IEEE Continuing Professional Education Committee, Chair of Subcommittee on Assessment for the Development of Learning Modules, 2003-2005.

Certification, *Human Participants Protection Education for Research Teams*, an online course, <http://phrp.nihtraining.com/users/login.php>, sponsored by the National Institute of Health (NIH), Jan. 2003, renewed 2011.

Reviewer of Grant Proposals

- Chair, Panel Review *NSF, Course, Curriculum and Laboratory Improvement*, Summer 2004.
- Chair, Panel Review, NSF, *Advanced Technology* program, Fall 2001.
- Panel Review, NSF, *Course, Curriculum and Laboratory Improvement*, Summer 2001.
- Panel Review, *FIPSE*, under the Department of Education, Spring 2000.
- Panel Review, *Preparing Tomorrow's Teachers to Use Technology Program*, under the Department of Education, Spring 1999.

Reviewer of Journal Papers

- *International Journal of Engineering Education*, 2007 – present (approximately 1 per year)
- *International Network for Engineering Education and Research*, Special Volumes, 2006- present (approximately 1 per year).
- *Educational Measurement: Issues and Practice*, 2006 - present (approximately 3 per year).
- *Journal of Engineering Education*, 2000 - present (approximately 5 articles per year).

Reviewer of Conference Papers

- *Frontiers in Education Conference*, 1999, 2000, 2001, 2003.
- *American Society for Engineering Education*, 2001, 2002, 2003, 2004, 2005.
- *Rocky Mountain Section of ASEE*, Golden, Colorado, 2000.

Member of Conference Planning Committee, *Rocky Mountain Section of ASEE*, Annual meeting, Golden, Colorado, 2000.

Session Chair

- *American Society for Engineering Education*, Montreal, Canada, 2002.
- *Frontiers in Education* conference, San Juan, Puerto Rico, 1999.

Consulting Editor, *The Art and Science of Student Assessment* (1998). Provided formative feedback on the development S. Brookhart's monograph, *The Art and Science of Student Assessment*. Brookhart, S. M. (1999). *The Art and Science of Classroom Assessment: The Missing Part of Pedagogy*. ASHE-ERIC, Higher Education Report (Vol. 27, No.1). Washington, DC: The George Washington University, Graduate School of Education and Human Development.

Internal Reviewer

- Center for Engineering Education, Minigrant applications, 2007, 2008, 2009, 2010, 2011.
- NSF Scholarship Program applications, 2000 – 2005, 2007, 2008, 2009, 2010, 2011.
- Undergraduate Conference in Mathematics, 2004.
- Center for Engineering Education Travel Awards, 2001, 2002.
- Center for Engineering Education Undergraduate Scholarships, 2001, 2002.

6. TEACHING RELATED ACTIVITIES

Courses Taught, Calculus for Engineers I (MACS 111), Calculus for Engineers II (MACS 112), Calculus for Engineers III (MACS 213), Honors Calculus II (MACS 121), Differential Equations (MACS 315), Probability and Statistics for Engineers (MACS 323), and Senior Seminar (MACS 462)

Survey and Instrument Development

- Revision of open-ended questions for the Colorado School of Mines school-wide course evaluations, 2004-2006 (change to be implemented Fall 2008).
- Continued development of Mathematical and Computer Sciences assessment plan, 1997-present (see: <http://inside.mines.edu/Academic/assess/>).
- Questions administered to students in core courses concerning their level of interest with respect to the offering of a minor in secondary mathematics or science education, 2006 and 2008.
- Questions administered to alumni concerning their level of support for offering a minor in secondary mathematics or science education, 2006.
- Senior Seminar, created a standard scoring rubric to be used across sections, 2004 (continues to be used today).
- Probability and Statistics for Engineers course, survey developed based on course goals and faculty-raised concerns, 2001.
- Research in the Department of Mathematical and Computer Sciences at the Colorado School of Mines (NSF REU), 1999.
- Graduating senior survey, 1998.

Member of Team that Established a Partnership with Colorado Christian University and Metropolitan State College. Through this partnership, mathematics students at the Colorado School of Mines may complete a minor in Mathematics Education with partner institutions. Colorado School of Mines students also have the option of completing a one year master's at Colorado Christian University after completing bachelor's degree in Mathematical and Computer Sciences at the Colorado School of Mines.

Member of the Boulder Valley School District: Algebra Task Force (1998 - 1999). Member of a team of educators that sought to develop a curriculum to introduce algebraic concepts to eighth grade students.

7. RESEARCH ACTIVITIES

Note: Student names in italics and * indicates full overhead at Colorado School of Mines' (CSM) standard rate.

EXTERNAL FUNDING

Principal Investigator

Moskal, B. & Hightower, J. (2009-2012). *Educational Partnership Between Colorado School of Mines and Meeker Elementary School*. ExxonMobil (Total: \$590,000, CSM: \$235,571).

Moskal, B. (2008-2009). *Rocky Mountain Section of the Mathematical Association of America Regional Conference*, ExxonMobil (CSM: \$25,000).

Moskal, B. and Olds, B. (2008-2009). *An Exxon Mobil Partnership Plan: Improving Mathematics and Science Teaching through a Collaboration Between the Colorado School of Mines and Mesa State College*, ExxonMobil (CSM: \$50,000).

Moskal, B. (2008-2009). *Tech Camp and Tech Club: Spanning the Middle School/High School Pipeline*, MAA, Tensor Foundation (CSM: \$6000).

Moskal, B., Fairweather, G., Skokan, C. & Baughman, G. (2008 – 2013). *The Bechtel K-5 Educational Excellence Initiative at the Colorado School of Mines*, Bechtel Foundation, challenge grant (CSM: \$2,500,000).

Matching:

Denver Foundation (March 2009, CSM: \$20,000, renewed May 2010, CSM: \$20,000; renewed May 2011; \$18,000).

J.P. Morgan Foundation (March 2009, CSM: \$15,000).

Shell Oil Contributions (January, 2009, 2010, 2011, CSM: \$5,000, \$5000, \$4000 respectively).

Boeing Corporation (December, 2009, 2010, CSM: \$20,000, \$20,000).

ECA Foundation (December, 2009, CSM: \$10,000; April, 2011, CSM: \$10,000).

Center for Hydrates and Other Solids (\$21,785) (PI: Wu).

Colorado Department of Education (\$995,938; CSM: \$855,819) (2010-2013)

Northrop Grumman (December, 2010, \$5000)

Moskal, B., Fairweather, G., Mehta, D. & Colagrosso, M. (2007 –2011). *BPC-DP: Broadening Female Participation in Computing: Middle School through Undergraduate Study*, NSF, CNS-0739233 (CSM: \$579,557*; REU supplement: \$6000).

Moskal, B., Fairweather, G., Skokan, C. & Falconer, T. (2007 - 2012). *GK-12 Learning Partnerships: Creating Problem Centered, Interdisciplinary Learning Environments*, NSF, DGE-0638719 (CSM: \$1,780,711*).

Moskal, B., Fairweather, G., Gosink, J., Munoz, D. & Lucena, J. (2006-2011). *National Science Foundation Scholarship Program: Retaining Students in Mathematics, Computer Science and Engineering*. NSF, DUE-0630888 (CSM: \$460,000).

Moskal, B. & Skokan, C. (2007-2011). *An Innovative Approach to Attracting Students to Computing: A Comprehensive Proposal*. Collaborative proposal with St. Joseph's University and Ithaca College, NSF, DRL- 0623808 (Collaborative with: NSF, DRL- 0623808, DRL-1019273, DRL-0624654, DRL-0624642, DRL-0624528, DRL-0624479) (Total: \$1,297,456, CSM: \$349,889*).

Moskal, B., Dann, W., Cooper, S. & Guzdial, M. (2005 - 2009). *Collaborative Research: Assessing Concept Knowledge and Attitudes in Introductory Computer Science*. NSF, DUE-0512064 (Total: \$400,000, CSM: \$215,943*).

Moskal, B., Bath, B., Skokan, C., Gosink, J. & Falconer, T (2003 - 2007). *GK-12 Learning Partnerships: Creating Problem Centered, Interdisciplinary Learning Environments*. NSF, DGE-0231611 (CSM Original: \$1,494,022, Supplement 1: \$48,000, Supplement 2: \$70,500, Supplement 3: \$68,000, CSM Total: \$1,680,522).

Moskal, B., Lasich, D. & Middleton, N. (2000 - 2004). *Science Related Degrees: Improving the Retention of Women and Minorities through Research Experience, Mentoring and Financial Assistance*. NSF, DUE-9987037 (CSM Original: \$217,995, Supplement: \$279,000, CSM Total: \$496,995).

Moskal, B., & Fairweather, G. (2004). *Undergraduate Mathematics Conference*. MAA-NSF Regional Undergraduates Mathematics Program, DMS-0241090 (CSM: \$1,600).

Co-Investigator

Note: Student names in italics.

Reed-Rhoades, T., Imbrie, P.K., Strobel, J., Steif, P., Pellegrino, J., DiBello, L., Moskal, B., Terry, R., Malave, C., & Froyd, J. (2009-2012). *Collaborative Research: ciHub, a Virtual Community to Support*

Research, Development and Dissemination of Concept Inventories. NSF, CCLI, 0920589 (\$1,999,677). Local PI: Moskal (CSM: \$188,918*).

Skokan, C. & Moskal, B. (2007-2008). *Mathematics and Science Workshops: Hybrid On-line and Classroom Experiences for Western Slope and Denver Metro Area Middle School Teachers*. Colorado Commission on Higher Education (CSM: \$141,000).

Skokan, C. & Moskal, B. (2006-2007). *Technology in the Science and Mathematics Classroom: A Western Slope Initiative*. No Child Left Behind, Improving Teacher Quality (CSM: \$123,271).

Skokan, C., Kosbar, L. & Moskal, B. (2004 - 2007). *Physical Science in the Middle School Classroom*. Colorado Department of Education (CSM: \$594,921).

Skokan, C. & Moskal, B. (2005 - 2006). *Teacher Quality Physical Science & Mathematics in the Middle School Classroom Rural Western Slope Initiative*. Colorado Commission on Higher Education (CSM: \$74,983).

Dean, A., Miller, L., Ewing, M., Moskal, B. & Fairweather, G. (2006). *Tech Camp 101*. Mathematical Association of America, Tensor Foundation (CSM: \$5000).

Dallman, S., Moskal, B., Fairweather, G. & Woodington, T. (2004). *Colorado Christian University, Colorado School of Mines and Selected Denver-Metro School Districts Partnership to Prepare Highly Qualified Mathematics Teachers for Grades 7-12*. Colorado Commission on Higher Education (Total: \$55,000, CSM: \$27,500). Subcontract: Moskal, B. (CSM: \$27,500). Renewal: Dallman, S., Moskal, B., Fairweather, G. & Bridgeman, T. (2005 - 2005) (Total: \$35,000, CSM: \$17,500).

Skokan, C., Kosbar, L. & Moskal, B. (2003). *Engineering in the Middle School Classroom*. Eisenhower Colorado Commission on Higher Education (CSM: \$48,568).

Skokan, C., Kosbar, L. & Moskal, B. (2002 - 2003). *Engineering Our World*. NSF, EEC-0230702 (CSM: \$99,560*).

Knecht, R., Cheney, D., Lasich, D. & Moskal, B. (2000 - 2001). *Team Decision Making: What is the Influence of Gender?* NSF, HRD-9979444 (CSM: \$99,933).

Knecht, R., Lasich, D. & Moskal, B. (2000 - 2001). *Gender Composition and Engineering Team Processes*. NSF, HRD-0080669 (CSM: \$30,000).

Streveler, R. & Moskal, B. (2000). Travel award to visit the Center for Engineering Learning and Teaching in Seattle, Washington, Sigma Xi (CSM: \$1000).

Evaluator (develop and implement project assessment plans, complete associated analysis and data interpretation)

Miller, K., Urban, K. Tracy, M. & Loui, M. (2011-2013). *Can Ethics Instruction Improve Students' Technical Skills in Computer Science?*, NSF, DUE-1044207 (Total: \$183,603). Evaluator and subcontract, Moskal, B. (CSM: \$44,000).

Bailey, G., Canas, J., Dwyer, J., Munoz, J., & Schovanec, L. (2009-2013). *ISISP: Integrated STEM Initiative on the South Plains*, NSF, DUE- 0930257 (Total: \$977,962). Evaluator and subcontract: Moskal, B. (CSM: \$128,004*).

Harris, G., Dwyer, J., Acuirre-Munoz, Z., Stevens, T. & Koepp, W. (2009-2014). The West Texas Middle School Math Partnership. Subcontract with Texas Tech, NSF, DUE- 0831420 (Total: \$2,058,536). Evaluator and subcontract: Moskal, B. (CSM: \$340,717*).

Rose, W., Huntoon, J., Baltensperger, B., Burmeister, S., Smith, W. & Howarth, J. (2009-2014). "Michigan Teacher Excellence Program (MITEP): A Model for Improving Earth Science Education Nationwide." Subcontract with Michigan Tech, NSF, DUE-0831948 (Total: \$1,337,520). Evaluator and subcontract, Skokan, C. & Moskal, B. (CSM: \$494,345*).

Harringer, A., Dunsmore, H., & Lutes, K. (2008-2011). *Surprising Possibilities Imagined and Realized through Information Technology (SPIRIT)*. Subcontract with Purdue University, NSF, DRL- 0737679 (Total: \$1,195,892). Evaluator and subcontract: Moskal, B. (CSM: \$112,411*)

Moskal, B. *Collaborative Research: Alice and Media Computation* (2007-2009). Collaborative proposal with Georgia Tech, St. Joseph's University and Carnegie Mellon University, NSF, DUE-0618380 (CSM: \$91,149*).

Fairweather, G. & Bialecki, B. (2005 - 2009). *United States-Hong Kong Research Experiences for Undergraduates in Numerical Analysis and Scientific Computing with Applications in Applied Science and Engineering*. NSF, DMS-0453600 (CSM: \$301,879). Evaluator: Moskal, B.

Lucena, J., Marr, J., Leydens, J., Mitcham, C. & Simoes, M. (2005 - 2008). *Enhancing Engineering Responsibility with Humanitarian Ethics: Theory and Practice of Humanitarian Ethics in Graduate Engineering Education*. NSF, EEC-059777 (CSM: \$225,000*). Evaluator: Moskal, B.

Cooper, S., Dann, W., Moskal, B. & Pausch, R. (2004 - 2007). *Program Visualization Using Virtual Worlds*. NSF, DUE- 0339734 (Total: \$449,977). Evaluator, Co-PI & Subcontract: Moskal, B. (CSM: \$75, 886*).

Cooper, S., Dann, W. & Moskal, B. (2003 - 2007). *Java-based Animation: Building Virtual Worlds for Object-oriented programming in Community Colleges*. NSF, DUE-0302542 (Total: \$1,056,855). Evaluator, Co-PI, & Subcontract: Moskal, B. (CSM: \$163,759*)

Downey, G., Lucena, J. & Moskal, B. (2003 - 2007). *Engineering Cultures: Building the Global Engineer*. NSF, DUE-0230992 (Total: \$330,173). Subcontract: Lucena, J. & Moskal, B. (CSM: \$164,179*).

Gosink, J. (2003 - 2007). *Serving Humanity: Engineers Improving the World through Regional, National, and International Community Service*. Hewlett Foundation Grant (CSM: \$1,150,000). Evaluator: Moskal, B.

Cooper, S., & Dann, W. (2002 - 2003). *Decreasing Attrition Using Animated Virtual Worlds*. NSF, DUE-0126833 (Total: \$75,000). Evaluator: Moskal, B. (CSM: \$15,448*).

Gosink, J. (2000). *A Program for Teacher Enhancement*. Center of Excellence Award and Mikkleson Grant (CSM: \$147,000 & \$25,000, respectively). Evaluator: Moskal, B.

Miller, K., Johnson, D., Camp, C. & King, L. (2000 - 2003). *Teaching Computer Ethics with Workshops and the Web*. NSF, DUE-9952841 (Total: \$409,922). Subcontract: Camp, T. & Moskal, B. (Evaluator) (CSM: \$111,151*).

Smith King, L. & Barr, J. (2000 - 2001). *An Environment for Interpreter-based Projects for the Programming Languages Course (MuLE)*. NSF, DUE-9952398 (Total: \$74,429). Evaluator: Moskal, B. (CSM: \$5,000).

Bath, B. (1998 - 1999). *Competence and Confidence Project (C²) for Grades 4-10*. Eisenhower Colorado Commission on Higher Education (Total: \$60,000). Evaluator: Moskal, B.

Outreach Coordinator

Taylor, P.C., Collins, R.T., Herring, A., Koh, C.A. & Moskal, B.M. (2008-2014). *Renewable Energy Materials Research Science and Engineering Center*, NSF, DMR-0820518 (CSM: \$9,300,000). Education and Outreach Coordinator: Moskal, B.

Luthy, R.G., Sadlack, D., Drewes, J., Khandan, N. (2011- 2016). NSF Engineering Research Center for Re-Inventing America's Urban Water Infrastructure, NSF, EEC-1028968 (Total: \$19.5 million, CSM: \$4,034,231). Education and Outreach Coordinator: Moskal, B.

Equipment Grant

Fairweather, G., Ganesh, M., Mehta, D., Moskal, B. & Nyland, L. (2004). *A Cluster of High Performance 64-Bit Computers*. Colorado Institute of Technology (CSM: \$205,961).

INTERNAL FUNDING

Moskal, B. (2008). *Pilot Program: A Tablet PC in Probability and Statistics*, Tech Fee Committee (Amount: \$14,143).

Navidi, W. & Moskal, B. (2001). *Probability and Statistics: Applications for Scientists and Engineers*. Center for Engineering Education (Amount: \$5,000).

Moskal, B. & Woodington, T. (2000). *Nurturing the Feedback Process: Providing Web Based Assessment Support to the Mathematical and Computer Sciences Department*. Colorado School of Mines, Curriculum Reform Steering Committee (Amount: \$5,000).

Moskal, B. (1999). *Enhanced Assessments in Mathematics and Computer Sciences*. Colorado School of Mines, Curriculum Reform Steering Committee (Amount: \$5,000).

GRADUATE STUDENT ADVISOR

- Probst, A. (in progress). "Designing instruction for Probability and Statistics using tablet PC's." Ph.D. Thesis, Colorado School of Mines.
 - Abstract presented at TAPIA: Celebration of Diversity in Computer Science, April 1-4, 2009 (with travel award).
- Forssen, A. (in progress). "Measuring students' attitudes in Information Technology (preliminary title), Master's Thesis, Colorado School of Mines.
- Parkhurst, R. (2007). "Engineering cultures: A comparative analysis of online and in-class implementations." Master's Thesis, Colorado School of Mines.
- Dewitt, P. (2007). "Effectiveness of Alice in computer science education." Master's Thesis, Colorado School of Mines.
- Dean, A. (2006). "The relationship among various intervention programs in increasing middle school student assessment program standardized test scores." Master's Thesis, Colorado School of Mines.

- Hutchinson, A. (2005). "A statistical analysis of outcomes in an educational assessment: Impact of the Alice curriculum on male and female performances and attitudes at community colleges." Master's Thesis, Colorado School of Mines.
- Miller, L. (2005). "Educational software considerations to meet the various needs of middle school mathematics students." Master's Thesis, Colorado School of Mines.

GRADUATE STUDENT COMMITTEES

- Member, Barbara Curry, Ph.D. (2004).
- Member, Jennifer Bailey, MS. (2004).
- Chair, Holly Eklund, MS. (2002).
- Chair, Melissa Laeser, MS. (2002).

8. PUBLICATIONS

REFEREED JOURNAL PUBLICATIONS

Forssen, A., Moskal, B., & Herriger, A. (accepted). "Measuring the Impact of a High School Intervention on Students' Attitudes in Information Technology: Validation and Use of an Attitude Survey." *Computers in Education Journal*. Special issue on Assessing Computer Programming Proficiency. Note: paper previously published in ASEE conference proceedings and republished here with ASEE permission.

Forssén, A., Lauriski-Karriker, T., Harriger, A. & Moskal, B. (2011). "SPIRIT: Encouraging High School Girls' Interests in Information Technology." *Journal of STEM Education*, 12 (5 &6), 46-57.

Munson, A., Moskal, B. Harriger, A., Lauriski-Karriker, T., & Heersink, D. (2011). "Computing at the High School Level: Changing What Teachers and Students Know and Believe," *Computers and Education: An International Journal*, 57 (2), 1836-1849.

Moskal, B. & Skokan, C. (2011). "Supporting the K-12 Classroom through University Outreach," *Journal of Higher Education Outreach and Engagement*, 15 (1), 53-75. Available at: <http://openjournals.libs.uga.edu/index.php/jheoe/issue/view/52>.

Moskal, B. & Fairweather, G. (2010). "Research Experience for U.S. Undergraduates: A Collaboration between Hong Kong and U.S. Mathematicians," *Mathematical Culture* (Appears in English and Chinese). Available at: <http://www.global-sci.org/mc>.

Moskal, B. (2010). "Self-Assessments: What are their Valid Uses?" *Academy of Management Learning and Education*, (9), 2, 314-320.

Moskal, B. (2009). "The role of external evaluators in educational projects and programs." *The Open-Access Education Journal*, 3, 51-53. Available at: http://www.bentham-open.org/pages/b_viewarticle.php.

Parkhurst, R., Moskal, B., Downey, G., Lucena, J., Bigley, T. & Elber, S. (2008). Engineering cultures: Online versus in-class." *The On-line Journal of Learning and Teaching*, 4 (4), 448-445.

Parkhurst, R., Moskal, B., Downey, G., Lucena, J., Bigley, T. & Elber, S. (2008). "Engineering cultures: Comparing student learning in on-line and classroom based implementations." *International Journal of Engineering Education*, 24 (5), 955-964.

- Moskal, B., Skokan, C., Kosbar, L. & Fairweather, G. (2008). "The synergy of middle school outreach." *Academic Exchange Quarterly*, 12 (2), 49-54.
- Moskal, B., Skokan, C., Munoz, D. & Gosink, J. (2008). "Humanitarian engineering: Global impacts and sustainability of a curricular effort." *International Journal of Engineering Education*, 24 (1), 162-174.
- Duke, B., Dwyer, J., Wilhelm, J. & Moskal, B. (2008). "Complex variables in junior high school: The role and potential impact of an outreach mathematician." *Teaching Mathematics and its Applications*, 27 (1), 38-47.
- Ewing, M., Moskal, B. & Fairweather, G. (2007). "Mathematical problem solving: A comparative analysis between the U.S. and Korea." *International Journal of Learning*, 14 (8), 267-273.
- Dwyer, J., Moskal, B. & Chenault, L. (2007). "College faculty in a high school mathematics classroom." *The International Journal of Interdisciplinary Social Science*. 2(1), 109-118.
- Moskal, B., Lucena, J. & Gosink, J. (2007). "Campus impact of a service learning curriculum." *Academic Exchange Quarterly, Special Edition on Service Learning*, 11 (3), 73-77.
- Moskal, B., Skokan, C., Kosbar, L., Dean, A., Westland, C., Barker, H., Nguyen, Q. & Tafoya, J. (2007). "K-12 outreach: Identifying the broader impacts of four outreach projects." *Journal of Engineering Education*, 96 (2), 173-189.
- Bauer, E. H., Moskal, B., Gosink, J., Lucena, J. & Muñoz, D. (2007). "Faculty and student attitudes toward community service: A comparative analysis." *Journal of Engineering Education*, 96 (2), 129 – 140.
- Dwyer, J., Moskal, B., Duke, B. & Wilhelm, J. (2007). "Complex variables in secondary school." *Mathematics Teaching 201*, March, 32-34.
- Downey, G.L., Lucena, J., Moskal, B., Parkhurst, R., Bigley, T., Hays, C., Jesiek, B., Kelly, L., Miller, J., & Ruff, S. (2006). "The globally competent engineer: Working effectively with people who define problems differently." *Journal of Engineering Education*, 95 (2), 107-122.
- Olds, B., Moskal, B. & Miller, R. (2005). "Assessment in engineering education: Evolution, approaches and future collaborations." *Journal of Engineering Education*, 94 (1), 13-25.
- Leydens, J., Moskal, B. & Pavelich, M. (2004). "Qualitative methods used in the assessment of engineering education." *Journal of Engineering Education*, 93(1), 65-72.
- Moskal, B., Fellman, J. & Bath, B. (2003). "Improving classroom assessment practices: A collaborative approach." *Academic Exchange Quarterly*, 7 (3), 317-321.
- Moskal, B. (2003). "Recommendations for developing classroom performance assessments and scoring rubrics." *Practical Assessment, Research & Evaluation*, 8 (14). Available: <http://pareonline.net/getvn.asp?v=8&n=14>.
- Streveler, R., Moskal, B. & Miller, R. (2003). "Using Boyer's four forms of scholarship to advance engineering education." *The Journal of the Scholarship of Teaching and Learning*, 3 (2). Available: <http://www.iusb.edu/~josotl/contents.v3.n2.htm>.

Laeser, M., Moskal, B., Knecht, R. and Lasich, D. (2003). "Engineering design: Examining the impact of gender and the team's gender composition." *Journal of Engineering Education*, 92 (1), 49-56.

Moskal, B., Leydens, J. & Pavelich, M. (2002). "Validity, reliability and the assessment of engineering education." *Journal of Engineering Education*, 91 (3), 351-354.

Moskal, B. (2002). "Improving the instruction of engineering calculus: Responding to student feedback." *The Journal of the Scholarship of Teaching and Learning*, 3 (1). Available: <http://www.iusb.edu/~josotl/contents.v3.htm>.

Moskal, B., Olds, B. & Miller, R. (2002). "Scholarship in a university assessment system." *Academic Exchange Quarterly*, 6 (1), 32-37.

Moskal, B. & Bath, B. (2001). "A response to the NCTM standards: Confidence and competence project (C²)." *Academic Exchange Quarterly*, 5 (4), 203-211.

Moskal, B. & Magone, M. (2001). "Making sense of what students know: Examining the modes, referents and relationships students display in response to open-ended decimal tasks." *Educational Studies in Mathematics*, 43 (3), 313-335.

Streveler, R., Moskal, B., Miller, R. & Pavelich, M. (2001). "Center for engineering education: Colorado School of Mines." *Journal of Engineering Education*, 90 (3), 383-387.

Moskal, B., Knecht, R. & Pavelich, M. (2001). "The design report rubric: Assessing the impact of program design on the learning process." *Journal for the Art of Teaching: Assessment of Learning*, 8 (1), 18-33.

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9. PRESENTATIONS

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Note: Presenter names underlined.

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Fairweather, G., Dihn, J. & Moskal, B. (2010, March). "International outreach: A secondary school in Uganda." The Third International Conference on Science and Mathematics Education in Developing Countries, Phnom Pehn, Cambodia, March 3-5, 2010, plenary talk.

Schneiderwind, J., Moskal, B., & Skokan, C. (2010, Feb.). "Connecting Math to the 7th grade student." Poster presentation at American Association for the Advancement of Science, San Diego, CA.

Moskal, B., Jackson, J., & Rader, C. (2009, Feb.). "Broadening Participation in Computer Science." Presentation at NSF Principal Investigators meeting, Washington, DC.

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Fairweather, G., & Moskal, B. (2008). "An International research experience for undergraduates in numerical analysis and scientific computing." Abstract in the proceedings of 2008 SIAM Annual Meeting, San Diego, California.

Fairweather, G., & Moskal, B. (2008). "Sharing talent: A research experience for U.S. undergraduate students in Hong Kong." Abstract in the proceedings of Asia – Pacific Association for International Education, Waseda University, Japan.

Fairweather, G. & Moskal, B. (2008). "International research experience for undergraduate mathematics students: A collaboration between the U.S. and Hong Kong". Presentation at the Joint Mathematics Meeting, San Diego, California

Fairweather, G., & Moskal, B. (2007). "An international REU site in mathematics: Hong Kong." Presentation at the Joint Mathematics Meetings, New Orleans, Louisiana.

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Dean, A., Moskal, B. & Skokan, C. (Jan. 2006) "Tech Camp 101: Results 2005." Poster presentation at the Joint Mathematics Meetings, San Antonio, Texas.

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Moskal, B., & Skokan, C. (2004). "GK-12 learning partnerships: An outreach program in engineering education." Poster presentation at the International Conference to Review Research in Science, Technology and Mathematics Education, Goa, India.

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Moskal, B. & Fellman, J. (2001). "Learning to use scoring rubrics: Experiences from the C² project." Presentation at the annual meeting of the Colorado Council of Teachers of Mathematics, Denver, Colorado.

- Moskal, B. & Fellman, J. (2000). "Developing valid and reliable scoring rubrics for the mathematics classroom." Workshop presented at the annual conference of the Colorado Council of Teachers of Mathematics, Denver, Colorado.
- Moskal, B. (2000). "Using the web as an instructional tool in engineering calculus." Presentation at the Learning, Teaching, and Technology: Assessment in the New Millennium, the Colorado Regional Higher Education Assessment Conference, Denver, Colorado.
- Moskal, B. & Bath, B. (2000). "Mathematical and Computer Science Department, Colorado School of Mines: Continuing the process of assessment reform." Presentation at the Assessment Symposium, Rose-Hulman Institute of Technology, Terre Haute, Indiana.
- Moskal, B. (2000). "Student feedback on the use of the web for instructional improvement." Presentation at the annual meeting of the American Society for Engineering Education, Rocky Mountain Section, Golden, Colorado.
- Moskal, B. & Knecht, R. (2001). "The design scoring rubric: Establishing validity and reliability." Presentation at the Assessment Symposium, Rose-Hulman Institute of Technology, Terre Haute, Indiana.
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- Moskal, B. & Bath, B. (1999). "Competency and confidence: Improving teachers' knowledge of mathematics, pedagogy and assessment." Presentation at the annual conference of the Colorado Council of Teachers of Mathematics, Denver, Colorado.
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- Pruszynski, D. & Moskal, B. (1995). "Using problem posing as a method of instruction and assessment in the statistics classroom." Presentation at the annual conference of the Pennsylvania Council of Teachers of Mathematics, Pittsburgh, Pennsylvania.
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- Pruszynski, D. & Moskal, B. (1994). "Improving college students' study habits through problem posing." Presentation at the regional meeting of the National Council of Teachers of Mathematics, Charleston, West Virginia.

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Moskal, B. & Meel, D.E. (1993). "Calculators, performance assessments: Issues related to the development of tasks." Presentation at the regional meeting of the National Council of Teachers of Mathematics, Pittsburgh, Pennsylvania.

INVITED PRESENTATIONS

External

Moskal, B., Strong, J., Schneiderwind, J., Baptiste, C & Strong, S. (2011). "STEM Education: Making Learning Fun", Open house for the STEM Academy, Highlands Ranch.

Moskal, B. (2010). "Attitude surveys which compliment information gained from concept inventories." Invited presentation at the National Meeting on STEM Concept Inventories, Alexandria, VA.

Steif, P., Imbrie, P.K., & Moskal, B. (2010). "As an instructor: What would you want reported on your students' performance on concept inventories." Invited presentation at the National Meeting on STEM Concept Inventories, Alexandria, VA.

Moskal, B., Strong, J., Asheim, M., Probst, A. & Skokan, S (2010). "Renewable Energy Activities: Designed for the K-12 Classroom and Budget." Invited Lecture, Colorado/Wyoming Section of the American Association of Physics Teachers, Lakewood, CO.

Moskal, B. (2007). "Assessing mathematics: Historical significance and future directions." Burton W. Jones Distinguished Teaching Award Invited Lecture, Rocky Mountain Section of the Mathematical Association of America Annual Meeting, Pueblo, CO.

Moskal, B. (2007). "Assessing student outcomes" in *The Role of Assessment in Helping Students Learn*. Invited member of expert panel on assessment at the Joint Mathematics Meetings, New Orleans, LA.

Fairweather, G. & Moskal, B. (2006). "Research experiences for undergraduates programs: Attracting the next generation of talent to mathematical research." Invited presentation at the 2006 Korea-USA Forum for Attracting Gifted/Talented Students into Science and Engineering, Seoul, Korea.

Moskal, B. (2006). "Design of a departmental assessment." Invited presentation at the University of Wyoming, Department of Mathematics, Laramie, Wyoming.

Moskal, B. (2005). "Basic concepts in classroom assessment." Invited presentation for the Western Regional Conference, Denver, Colorado.

Skokan, C., Moskal, B. & Dean, A. (2005). "Engineering as a hook in the mathematics classroom." Invited presentation at the Middle School Teacher Summit, Colorado Department of Education.

Moskal, B. (2004). "Useful concepts in quantitative and qualitative research." Invited workshop at the International Conference on Engineering Education, Gainesville, Florida.

Moskal, B. (2003). Invited Member of Expert Panel on Assessment. "MAA project NeXT panel discussion." Invited panel member at the Joint Mathematics Meetings, Baltimore, Maryland.

Moskal, B. (2002). "Departmental goals." Invited presentation at the Rocky Mountain Section of Mathematical Association of America, Laramie, Wyoming.

Moskal, B. (2002). "Assessing math outcomes in support of science and engineering programs." Invited presentation at the South Dakota School of Mines, Rapid City, South Dakota.

Moskal, B. (2002). "Assessing engineering design projects." Invited presentation at the South Dakota School of Mines, Rapid City, South Dakota.

Moskal, B., Skokan, C. & Dean, A. (2005). "Embedding science in the mathematics classroom." Invited presentation at Math Summit, Colorado Department of Education.

Moskal, B. (1998). "Building a framework for understanding student responses to open-ended tasks." Invited presentation at Cherry Creek's Summer Institute Mathematics and Much More, Denver, Colorado.

Internal

Moskal, B. (Feb. 2003). "The engineering design team process: Does gender matter?" Invited presentation for the Van Tuyl Lecture Series, Geology and Geological Engineering.

Moskal, B. (Oct. 2002). "The engineering design process: Does gender matter?" Colloquium presentation in the Mathematical and Computer Sciences Department.

Moskal, B. (April 2002). "Creating valid multiple choice assessments." Invited presentation to the faculty of Nature and Human Values.

Moskal, B. (Feb. 2002). "Working towards balance." Invited presentation at the Extraordinary Women Seminar, sponsored by the Colorado School of Mines Panhellenic Council.

Moskal, B. (Nov. 2001). "Creating and implementing a budget." Invited presentation at the Graduate Women's Forum, CSM.

Moskal, B. (Oct. 2001). "Grant implementation strategies." Invited presentation at the Graduate Women's Forum, CSM.

Moskal, B. (Feb. 2001). "Funding and grant writing strategies." Invited presentation at the Graduate Women's Forum, CSM.

Streveler, R. & Moskal, B. (Aug. 2000). "Center for Engineering Education." Invited presentation at the Faculty Conference, CSM.

Moskal, B. (Aug. 1999). "Assessment of EPICS: A response to a school wide concern." Invited presentation to the Engineering Practices Introductory Course Sequence Program faculty, CSM.

10. HONORS AND AWARDS

Zook, K., Yoder, M., & Moskal, B. (2011). "Bringing Engineering into the Elementary Classroom: A Bechtel K-5 Educational Excellence Initiative." Paper to appear in the Proceedings of the Annual Meeting of the American Society for Engineering Education, Vancouver, BC, Canada. Selected through national competition as ASEE Best Practices in K-12 Education Award: Elementary.

GK-12 Website Design, National Science Foundation (2011), Washington, DC, Honorable mention for “Best GK-12 Website Design.”

Mind, Heart and Spirit Award for Academics, Duquesne University (2010), Pittsburgh, PA, recognizes Duquesne alumni who exemplify the pillars of the University’s mission—academic excellence; moral and spiritual values; ecumenism and diversity; service; and world concerns.

O’Hara, C., Case, J., Brockway, J., Asheim, M., Moskal, B. & Lung, L. (2010). “Energizing Middle School Mathematics and Science: An NSF GK-12 Initiative.” Paper in the proceedings of the Annual Meeting of the American Society for Engineering Education, Louisville, KY. Selected through national competition as ASEE Best Practice in K-12 Engineering Education: Middle School.

Moskal, B. (2010). Selected as one of three representatives from CSM as a participant Academic Management Institute.

Invited member of expert panel on sustainability of K-12 projects, GK-12 annual PI conference, Washington, DC (March, 2009).

Invited expert on assessment for the Problem Based Student Learning Summit, Washington, DC (Feb. 2009).

Invited expert on assessment for the Engineering Education Evaluation Tools workshop, Washington, DC (May 2009).

Burton W. Jones Award for Distinguished Teaching (2006), Rocky Mountain Section of the Mathematical Association of America recognizes one outstanding collegiate mathematics teacher each year from the states of Colorado, Wyoming, South Dakota and parts of Montana.

William Elgin Wickenden Award (2006), American Society for Engineering Education, for the paper: Olds, B., Moskal, B. & Miller, R. (2005). "Assessment in engineering education: Evolution, Approaches and Future Collaborations." *Journal of Engineering Education*, 94 (1), 13-25. Reflects the highest standards of scholarly research and was selected from among 35 papers published in the *Journal of Engineering Education* for the year of 2005.

Alfred E. Jenni Fellowship (2004), Colorado School of Mines. Award supplements a faculty member’s salary for one year with the purpose of supporting a project that is designed to contribute to the teaching effectiveness and educational scholarship of the institution. The supported project was the establishment of a partnership with Colorado Christian University with the purpose of offering a minor in mathematics education to Colorado School of Mines students. Additionally, undergraduate Colorado School of Mines students have the option of completing a four year bachelor degree followed by a one year masters with teaching certification at Colorado Christian University.

CSM Alumni Teaching Award (2003), Colorado School of Mines Alumni Association. Designed to recognize superior teaching at the undergraduate level over a period of years.

Outstanding CSM Faculty Member in Mathematical and Computer Sciences (2001), Colorado School of Mines Alumni Association. This award is based on the majority vote of the graduating senior class.

Invited participant in the "Forum on Engineering Education Leadership." This Forum was by invitation only as part of the annual meeting of the *American Society for Engineering Education* and is sponsored by the Educational Research and Methods Division, 2001 (travel award: ~\$150).

Frontiers in Education, New Faculty Fellowship (2000). Award included travel expenses (Amount: \$1000). This fellowship required an application and a peer reviewed paper.

Award by University of Pittsburgh's School of Education Research Fund Committee toward the completion of dissertation study (1996), *Written open-ended Tasks: What information concerning students' mathematical knowledge do written responses to open-ended tasks offer to classroom teachers?* (Amount: \$2,000).

Superior Academic Performance (1996-1997), Fellowship, University of Pittsburgh's School Alumni Association (Amount: \$2,000). This fellowship resulted from a review of academic performance.

General Excellence in Secondary Education (1989), Duquesne University's School of Education Faculty Award. This award was based on academic performance and observations completed during student teaching.

11. CSM COMMITTEE SERVICE

Departmental Committees. Chair of search committee for mathematics/computer science education position, 2006-2007 and 2007-2008, Member of search committee for mathematics/computer science statistics position 2003-2004, Department liaison to the Mathematical Association of America 2003-present, MCS Graduate Committee 2008-present.

University Committees, Member of University Evaluation Committee 2003-2005, Member of Assessment Committee 2000-2004, 2006-2010, CSM's Curriculum Committee 2003-2004 (Prior to receiving tenure: McBride Honors Tutorial Committee).

Co-founder of the Student Crisis Committee with the wife of CSM's President (Sharon Trefny), 2004 - 2006.

Member of Faculty Panel, "Teaching and/or research at the college/university level as a career option." Invited participation by the *Graduate Women's Forum*, CSM, 2002.

Faculty Representative:

- Faculty Department Tour, 2006, 2007, 2008.
- Option Showcase, January 2004.
- Organized and gave presentation for Discover CSM, 2003.
- Student Panel for Explore CSM, July 2001, 2002.
- Parent Panel for Explore CSM, July 2001, 2002.
- "Take Your Daughter to Work" Luncheon, April, 2001.

CSM Sponsor for STEMapoolooza, over 10,000 attendees each year, 2009, 2010.

12. INTERVIEWS AND NEWS STORIES

Featured article in *Energy and the Earth*. "Math with Attitude." Available:
<http://issuu.com/minespr/docs/2010researchngls>

Kipp, C. "Colorado School of Mines connects with District 50". *MetroNorth Newspapers*, February 8, 2008.