Professor James Middleton

Professor of Science, Technology, Engineering and Mathematics Education

School of Education

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About

James A. Middleton is Professor of STEM Education in the School of Education at the University of Birmingham. He holds a concurrent appointment as Professor of Engineering Education and Director of the Center for Research on Education in Science, Mathematics, Engineering, and Technology at Arizona State University. Prior to these appointments, Dr. Middleton served as Associate Dean for Research for the Mary Lou Fulton College of Education at Arizona State University for 3 years, and as Director of the Division of Curriculum and Instruction for another 3 years plus. Dr. Middleton just finished a term as Senior co-Chair of the Special Interest Group for Mathematics Education in the American Educational Research Association. Previously he served for three years on the National Council of Teachers of Mathematics Research Committee, chairing that committee in 2006. He has served on several task forces for the NCTM, is a regular reviewer for the NSF and the US Department of Education, and serves on the Boards of several regional and national-level research centers. He has been a consultant for the Rand Corporation, the US National Academies, the American Statistical Association, the IEEE, and numerous school systems.

Qualifications

- PhD, (Educational Psychology) University of Wisconsin
- MS (Educational Psychology), University of Wisconsin
- BA Honours (Psychoogy), California State University-Chico.

Research

Jim's research interests focus in the following areas where he has published extensively: Children's mathematical thinking; Teacher and Student motivation in mathematics; and Teacher Change in mathematics. He is currently developing methodologies for utilizing the engineering design process to improve learning environments in Science, Engineering and Mathematics. He has also written on effective uses of educational technology in mathematics and science education as a natural outgrowth of these interests. To fund his research, Jim has garnered over $20 million in grants to study and improve mathematics education in urban schools. Notable among these was a $1.8 million research grant to model the longitudinal development of fractions, rational number and proportional reasoning knowledge and skills in middle school students.

Current Projects

- Sullivan, P., Clarke, D., Cheeseman, J., & Middleton, J. A. (2010-2013). Encouraging persistence maintaining challenge. Australian Research Council.
- Sloane, F., & Middleton, J.A. (2007 -2011) Moving Teachers and Students from Arithmetic to Algebraic Thinking in Murphy School District (K-5): Building Multilevel Insight. National Science Foundation
- Kubishta, A., & Middleton, J.A., (2010). Motivation of secondary students enrolled in a summer mathematics program.
- Middleton, J.A., Toncheff, M., Haag, S., Zandieh, M., & Tridane, A. (2009-2010). Mathematics and Science Partnership: Mathematical Modeling Project. Arizona Department of Education
- Megowan, C., Middleton, J. A., & Greenes, C. (2009 – 2013). Innovation through Institutional Integration: The Modeling Institute. National Science Foundation grant to develop a STEM College for Kids, and an associated content Masters' Degree for middle school teachers

Publications

Selected Publications

Middleton, J. A., & Jansen, A. (in press). *Research-based Strategies for Improving Student Engagement in Mathematics: Why Motivation Matters*. Reston, VA: National Council of Teachers of Mathematics (estimated publication date, Spring, 2011).

Leavy, A. M., & Middleton, J. A. (in press). Elementary and Middle School Students' Construction of Typicality. To appear in *Journal of Mathematical Behavior*.

Middleton, J. A. (2010). Research on Science and Mathematics Learning: The Pragmatics of Cognition and its Implications for Science and Mathematics Teaching and Policy. *The Journal of Education,* 189(3), 65-72.

Lamberg, T., & Middleton, J.A. (2009). Design Research Perspectives on Transitioning from Individual Microgenetic Interviews in a Laboratory Setting to a Whole Class Teaching Experiment. *Educational Researcher*, 38(4), 233-245.

Kurz, T., Middleton, J. A., & Batarelo, I. (2009). Examining Elementary Preservice Teachers' Perspectives Concerning Curriculum Themes for Video Case Integration. *Educational Technology Research and Development*. Available: **http://www.springerlink.com/content/47616465m227725x/fulltext.pdf**

Lesh, R., Middleton, J. A., Caylor, E., & Gupta, S. (2008). A Science of Need: Designing Tools to Engage Students in Modeling Complex Data. *Educational Studies in Mathematics*, 68(2), 113-130.

Oksuz, C., & Middleton, J. A. (2007). Middle School Children's Understanding of Algebraic Fractions as Quotients. *International Online Journal of Science and*

Mathematics Education, 7(1), [Online serial], Available: **http://www.upd.edu.ph/~ismed/online/articles/middle/abstract.htm**