

Engineering Design Center for Service-Learning (EDCSL)

Publications and Presentations List

March, 2008

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Publications

D. Moseley, N. Tate, A.A. Kline, and B.M. Aller, "Introducing STEM Concepts to Middle-school Students through Interactive Learning," **ASEE North Central Section regional conference proceedings**, March 28-29, 2008, Wright State University, Dayton, OH.

A. Eaton, B. Richmond, K. Warners, J. Cook, E. Tsang, B.M. Aller, and A.A. Kline, "Designing and Utilizing an Apparatus to Study the Ray Properties of Light," **ASEE North Central Section regional conference proceedings**, March 28-29, 2008, Wright State University, Dayton, OH.

A.C. Hyder, B.M. Aller, and A.A. Kline, "Using Global Positioning Systems (GPS) to Involve Students in Science and Technology," **ASEE North Central Section regional conference proceedings**, March 28-29, 2008, Wright State University, Dayton, OH.

P. Pagano, A. Rossman, K. Vasilnek, B.M. Aller, A.A. Kline, E. Tsang, and E. Brabandt, "First-year Experience and Beyond: Using the Engineering Design Process to Support Learning and Engineering Skill Development," for the **ASEE 2007 National Meeting**, Honolulu, Hawaii, June 2007.

A.A. Kline, B.M. Aller, C. Crumbaugh, P. Vellom, and E. Tsang, "WIP: Western Michigan University Partnership with K-12 Teachers to Improve STEM Education," **Proceedings of the Frontiers in Engineering Conference**, paper 1322, San Diego, CA, October, 2006.

A. Kline, B.M. Aller, and E. Tsang, "WIP: Development, Implementation, and Evaluation of Materials to Support STEM-related Activities in K-12 Classrooms," **Proceedings of the Frontiers in Engineering Conference**, paper 1566, Indianapolis, IN, October, 2005.

A.A. Kline, E. Tsang, and B.M. Aller, "Service-Learning Engineering Design Activities at Western Michigan University to Support K-12 STEM Education," **ASEE 2005 National Meeting**, paper 2005-1802, Portland, Oregon, June 12-15, 2005.

C. Crumbaugh, P. Vellom, E. Tsang, and A. Kline, "Western Michigan University's Collaborative Effort to Enhance K-16 STEM Teaching and Learning," **International Network for Engineering Education and Research (iNEER)**, Special Volume, March 2005, pp. 17-32.

A.A. Kline, E. Tsang, C. Crumbaugh, P. Vellom, and B. Cobern, "Work in Progress: Establishing an Engineering Design Center for Service-Learning at Western Michigan University," **Proceedings of the Frontiers in Engineering Conference**, Savannah, GA, October, 2004, pp. F3E-13 – F3E-14.

C. Crumbaugh, P. Vellom, A.A. Kline, and E. Tsang, "Integrating First-Year Engineering Design and Pre-Service Science Education: A Model for Engineering and Education Collaboration to Enhance K-16 STEM Education," **Proceedings of the Frontiers in Engineering Conference**, Savannah, GA, October, 2004, pp. S2E-14 – S2E-18.

E. Tsang and A.A. Kline, "Design of an Inexpensive Optics Demonstration/Experimentation Kit for Middle School," **Proceedings of the American Society of Engineering Education Annual Meeting**, Salt Lake City, UT, June 2004.

R. Petersen, A. Madlangbayan, T. Lee, K. Nielsen, A. Correa, and E. Tsang, "Re-Design of an Optical Phenomena Teaching and eXperiment (OPTX) Kit," **ASEE North Central Regional Meeting**, Kalamazoo, MI, April 3-5, 2004.

A.A. Kline, C. Crumbaugh, P. Vellom, E. Tsang, and B. Cobern, "Western Michigan University College of Engineering and College of Education Collaborative Effort to Enhance Student Learning," **Proceedings of the Frontiers in Engineering Conference**, Boulder, CO, November 2003.

E. Boromisa, K. Nielsen, P. Reinhart, E. Tsang, and A. Correa, "Creating an Optical Demonstration for Middle School Science Classrooms," **Proceedings of the Annual Meeting of the American Society for Engineering Education- North Central Section**, April 12-14, 2003, Columbus, OH, 46-55.

Presentations (underline denotes presenter)

D. Moseley, N. Tate, A.A. Kline, and B.M. Aller, "Introducing STEM Concepts to Middle-school Students through Interactive Learning." *ASEE North Central Section regional conference proceedings*, March 28-29, 2008, Wright State University, Dayton, OH.

A. Eaton, B. Richmond, K. Warners, J. Cook, E. Tsang, B.M. Aller, and A.A. Kline, "Designing and Utilizing an Apparatus to Study the Ray Properties of Light," *ASEE North Central Section regional conference proceedings*, March 28-29, 2008, Wright State University, Dayton, OH.

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P. Pagano, A. Rossman, K. Vasilnek, B.M. Aller, A.A. Kline, E. Tsang, and E. Brabandt, "First-year Experience and Beyond: Using the Engineering Design Process to Support Learning and Engineering Skill Development," for the *ASEE 2007 National Meeting*, Honolulu, Hawaii, June 2007.

E. Tsang, J. Cook, A. Eaton, A. Mason, B. Richmond, S. Orey, and K. Warners, "Service-Learning Design Projects Make an Impact on K-12 Science Teaching and Learning," Capitol Hill Symposium and *SENCER (Science Education for New Civic Engagement and Responsibilities) Poster Session*, Washington, D.C., March 2007.

A.A. Kline, B.M. Aller, C. Crumbaugh, P. Vellom, and E. Tsang, "WIP: Western Michigan University Partnership with K-12 Teachers to Improve STEM Education," *Proceedings of the Frontiers in Engineering Conference*, paper 1322, San Diego, CA, October, 2006.

A.A. Kline and B. M. Aller, "Service-Learning Engineering Design Projects in the Community," *College of Engineering and Applied Sciences Seminar Series and First-Year Program Seminar Series at Western Michigan University*, October 2006; February and October, 2007.

B.M. Aller, A.A. Kline, and E. Tsang, "Incorporating Service-Learning Projects into the Senior Capstone Design Experience," Poster at *National Academy of Engineering Meeting*, Washington, DC, May 2006.

A. A. Kline, B. M. Aller, and E. Tsang, "Using Service-Learning in the Engineering Curriculum to Support STEM Education in K-12 Classrooms," Poster at *National Academy of Engineering Meeting*, Washington, DC, May 2006.

A. Rossman, P. Pagano, K. Vasilnek, A. McKindles, E. Brabandt, E. Tsang, B.M. Aller, A.A. Kline, and F. Ryan, "Using the Engineering Design Process to Provide Scientific Demonstration Kits for the Study of X-ray Diffraction for High School Students," Poster at *American Society of Engineering Education Regional Meeting, Illinois-Indiana and North Central Joint Section Conference*, Indiana University Purdue University Fort Wayne (IPFW), Fort Wayne, IN, March 31- April 1, 2006.

A. Hyder, J. Hiller, J. Araujo, B.M. Aller, and A.A. Kline, "Student-designed Materials for K-12 Classroom Demonstrations of Science, Technology, Engineering, and Mathematics (STEM) Concepts," Poster at *American Society of Engineering Education Regional Meeting, Illinois-Indiana and North Central Joint Section Conference*, Indiana University Purdue University Fort Wayne (IPFW), Fort Wayne, IN, March 31- April 1, 2006.

A. Kline, B.M. Aller, and E. Tsang, "WIP: Development, Implementation, and Evaluation of Materials to Support STEM-related Activities in K-12 Classrooms," *Proceedings of the Frontiers in Engineering Conference*, paper 1566, Indianapolis, IN, October, 2005.

A.A. Kline, E. Tsang, and B.M. Aller, "Service-Learning Engineering Design Activities at Western Michigan University to Support K-12 STEM Education," *Proceedings of the American Society of Engineering Education Annual Meeting*, paper 2005-1802, Portland, Oregon, June 12-15, 2005.

A.A. Kline, E. Tsang, C. Crumbaugh, and P. Vellom, "Western Michigan University Engineering Design Center for Service-Learning (EDCSL)," Poster at *NSF Engineering and Computing Education Grantee Meeting 2005*, Washington DC, February 16-18, 2005.

P. Vellom, C. Crumbaugh, A. Kline, and E. Tsang, "An Engineering Education/Teacher Education Collaboration: Building Bridges Between Disciplines," *Annual International Conference of the Association for the Education of Teachers in Science*, Colorado Springs, CO, January 19-23, 2005.

A.A. Kline, E. Tsang, C. Crumbaugh, P. Vellom, and B. Cobern, "Work in Progress: Establishing an Engineering Design Center for Service-Learning at Western Michigan University," *Proceedings of the Frontiers in Engineering Conference*, Savannah, GA, October, 2004.

C. Crumbaugh, P. Vellom, A.A. Kline, and E. Tsang, "Integrating First-Year Engineering Design and Pre-Service Science Education: A Model for Engineering and Education Collaboration to Enhance K-16 STEM Education," *Proceedings of the Frontiers in Engineering Conference*, Savannah, GA, October, 2004.

E. Tsang and A.A. Kline, "Design of an Inexpensive Optics Demonstration/Experimentation Kit for Middle School," *Proceedings of the American Society of Engineering Education Annual Meeting*, Salt Lake City, UT, June 2004.

R. Petersen, A. Madlangbayan, T. Lee, K. Nielsen, A. Correa, and E. Tsang, "Re-Design of an Optical Phenomena Teaching and eXperiment (OPTX) Kit," *ASEE North Central Regional Meeting*, Kalamazoo, MI, April 3-5, 2004.

A.A. Kline, C. Crumbaugh, P. Vellom, E. Tsang, and B. Cobern, "Western Michigan University College of Engineering and College of Education Collaborative Effort to Enhance Student Learning," *Proceedings of the Frontiers in Engineering Conference*, Boulder, CO, November 5-8, 2003.

E. Boromisa, K. Nielsen, P. Reinhart, E. Tsang, and A. Correa, "Creating an Optical Demonstration for Middle School Science Classrooms," *Spring Meeting of the American Society for Engineering Education- North Central Section*, April 12-14, 2003, Columbus, OH, 46-55.

Newspaper Articles

E. Dudley, "Senior engineering majors design transit cart, LiveFree Lift," *Western Herald*, Vol. 89. No. 103, March 30, 2005. Website address accessed July 21, 2005.

< <http://www.westernherald.com/vnews/display.v/ART/2005/03/30/424a0bca69300%20>>

K.C. Arabe, "Project Prototype: Industrial Market Trends," ThomasNet IndustrialNewsRoom, June 7, 2005. Website address accessed July 21, 2005.

< http://news.thomasnet.com/IMT/archives/2005/06/project_prototy.html>

College Newsletters

B. Harik, Editor-in Chief, A. Routhier and M. Anderson, Editors, "Student Accolades, College of Engineering and Applied Sciences," PRISM Western Michigan University's Newsletter for Academic Affairs, Volume 27, January 2008. <http://www.wmich.edu/provost/prism/current.pdf>

J. Fiala, Editor, "Kalamazoo middle-schoolers study engineering careers at WMU," CEAS e-News, July 31, 2007. <http://www.wmich.edu/engineer/newsletter.htm>

J. Fiala, Editor, "Mattawan math students turn numbers into goblets," IMe-News Posting, June 19, 2007. <http://www.wmich.edu/ime/imenews.htm>

J. Fiala, Editor, "EDCSL brings engineering to Kalamazoo Boys & Girls Club," CEAS e-News, June 30, 2006. <http://www.wmich.edu/engineer/newsletter.htm>

Publications Submitted and Under Review

A.A. Kline, B.M. Aller, and E. Tsang, "First-Year Design and Beyond: A Sequence of Service-Learning Design Courses to Build Student's Professional Skills," **International Network for Engineering Education and Research (iNEER)**, Special Volume, 2008 (submitted December, 2007).

Abstracts Submitted and Under Review

Workshop Proposal Submitted and Under Review

Proposals Funded

“21st Century After-School Enrichment Program,” Funding Agency – Kalamazoo Communities In School (KCIS) Foundation, Inc. PI – Edmund Tsang, Co-PI – Andrew Kline, Frank Severance, Fred Sitkins. Amount: \$2,016.46. Period: January – May, 2005

“Supplemental Funds for Research Experiences for Undergrads (REU): WMU Design Center for K-12 Mathematics and Science Learning,” **Investigator: A.A. Kline (Year 1 funded at \$15,095, June 1, 2004, expiring June 30, 2006).**

“Supplemental Funds for Research Experiences for Undergrads (REU): WMU Design Center for K-12 Mathematics and Science Learning,” **Investigator: A.A. Kline (Year 2 funded at \$26,049, July 18, 2005, expiring June 30, 2006).**

Proposals Under Review

“**The Promise of an Engineering Career: WMU’s Service Learning Summer Camp,**” A.A. Kline, B.M. Aller, M. Keil, E. Carr, and F. Severance. Submitted to State Farm Foundation, October 12, 2007. Requested funds from State Farm: \$103,404. Total value: \$177,292. Project Period: January, 2008 – June, 2010.

“**Enhance Service Learning Engineering Design through Rapid Prototyping Technology,**” A. Kline (PI), E. Tsang, B.M. Aller, M. Keil, and S. Urdarevik. Submitted to NSF EEC, November 20, 2007. Requested funds: \$646,732. Project Period: June 1, 2008 – May 31, 2011.

Proposals Submitted, but not Funded

“**The Promise of an Engineering Career: WMU’s Service Learning Summer Camp,**” A.A. Kline, B.M. Aller, M. Keil, E. Carr, and F. Severance. Submitted to State Farm Foundation, November 15, 2006. Requested funds from State Farm: \$103,404. Total value: \$177,292. Project Period: February, 2007 – June, 2009.

“**Engineering Design Center for Service-Learning,**” Submitted February 27, 2006 to the Corporation for National and Community Service Learn and Serve America Higher Education Program. (September 2006 - 2009). First-year funding request of \$141,000, with possible renewal for two additional years. Investigators: A.A. Kline (lead), B.M. Aller, K. Wong, and E. Tsang.

“**Research to Develop, Test and Apply New Assessment Instruments to Support and Broaden Student Learning Using the Context of Engineering-based Service Learning,**” B.M. Aller, A.A. Kline, R.P. Hale. Submitted to NSF EEC August 15, 2005. (3 year project starting March 1, 2006; \$638,523 requested).

“**Building a Community of Scholars to Assess STEM-related Service Learning,**” B.M. Aller, J.M. Esson, A.A. Kline, E. Tsang, and A. Geist. Submitted to NSF CCLI, May 18, 2005. (2 year project, starting January 1, 2006; \$150,000 requested).

Proposal submitted to NSF in April 2004 entitled “**Focused Research Initiative (FRI) to Enhance Math and Science Learning for K-12 Students with Physical Limitation.**” PI – Judah Ar-Gur, Co-PI – Marcia Fetters, Debra Hazel, Norali Pernalete, and Edmund Tsang; Amount Requested: \$294,616 (3 years); Status: Not Funded.