

SUSANNAH V. HOWE

Picker Engineering Program
Smith College
Northampton, MA 01063
(413) 585-3626
showe@smith.edu

EDUCATION

- Ph.D. 2000 Cornell University, *Civil and Environmental Engineering (Structural Materials)*
Dissertation: *A Study of Non-Evaporable Water Content in Cement-Based Mixtures with and without Pozzolanic Materials*
- M.Eng. 1998 Cornell University, *Civil and Environmental Engineering (Structural Engineering)*
- B.S.E. 1996 Princeton University, *Civil Engineering and Operations Research, summa cum laude*

EMPLOYMENT HISTORY

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|----------------|--|--|
| 2003 – present | Design Clinic Director
Senior Lecturer (2011-present)
Lecturer (2006-2011)
Visiting Asst. Prof. (2003-2006) | Smith College
Picker Engineering Program |
| 2010 – 2012 | R&D Engineer | Protopeutics, Inc. |
| 2007 – 2009 | Consulting Engineer | Page Product Design |
| 2002 – 2003 | Visiting Assistant Professor | University of Massachusetts, Amherst
Civil and Environmental Engineering |
| 2002 | Special Projects Coordinator | University of Massachusetts, Amherst
Women in Engineering Program |
| 2000 – 2001 | Professional Development Associate | Cornell University
College of Engineering |
| 2000 – 2001 | Laboratory Co-Instructor | Cornell University
Civil and Environmental Engineering |
| 1996 – 2000 | Graduate Research Assistant | Cornell University
Civil and Environmental Engineering |
| Summer 1997 | Research Assistant | NIST
Building and Fire Research Laboratory |
| Summer 1994 | Construction Management Intern | Boston Central Artery/Third Harbor
Tunnel Project |

RESEARCH INTERESTS

- Innovations in capstone engineering design education
- Entrepreneurship education across disciplines at the undergraduate level
- Durability and structural performance of cementitious and natural building materials

TEACHING EXPERIENCE

Smith College

Engineering Design Clinic
Applied Design and Prototyping (co-instructor, intensive short course)
Engineering and Global Development (co-instructor)
Innovation and Product Design (2-week course in Nicaragua, with Smith and GVSU faculty)
Introduction to AutoCAD (intensive short course)
Structures and the Built Environment (guest lecturer, team advisor)

University of Massachusetts, Amherst

Introduction to AutoCAD
Women in Engineering Freshman Seminar

Cornell University

Physical and Computational Material Simulation (laboratory component)
Reinforced Concrete Design (guest lecturer)

DISTINCTIONS

Kathleen Compton Sherrerd '54 and John J. F. Sherrerd Prize for Distinguished Teaching (2013)
for distinguished teaching and demonstrated enthusiasm and excellence at Smith College

National Science Foundation Graduate Fellowship

John E. Perry Outstanding Teaching Assistant Prize
in Civil and Environmental Engineering at Cornell University

George Winter Graduate Fellowship
for structural engineering at Cornell University

John McMullen Scholarship (awarded but declined)
for graduate studies at Cornell University

W. Mack Angus Prize
for highest ranked Civil Engineering student at Princeton University

Joseph Clifton Elgin Prize
for advancement of Princeton University interests in the community

Phi Beta Kappa, Tau Beta Pi, and Sigma Xi

GRANTS

Coordinator: Funding for capstone Design Clinic course and projects: >\$450,000 to date supporting 65 projects over 10 years.

Principal Investigator: "Out of the Shadows: Improving Interest and Persistence for Women in Engineering," Engineering Information Foundation, July 2011-June 2012, \$12,868.

Co-Principal Investigator: "Web-Based Dissemination of Engineering Communication Tools and Strategies in the Context of Capstone Design Courses," Engineering Information Foundation, June 2011-June 2012, \$15,000.

Sub-Contract PI: "Integrated Design Engineering Assessment and Learning System (IDEALS)," National Science Foundation, September 2009-August 2011, \$149,973.

Principal Investigator: "Institutionalizing Entrepreneurship at Primarily Undergraduate Institutions," National Collegiate Inventors and Innovators Alliance, May 2005-December 2005, \$15,000.

Grant Manager: "The Smith Engineering Entrepreneurial Initiative for Women Engineers," National Collegiate Inventors and Innovators Alliance, January 2004-August 2009, \$24,500.

JOURNAL ARTICLES / BOOKS

Howe, S., Goldberg, J., Palo, S., and Terpenney, J. "Guest Editorial: The 2012 Capstone Design Conference," *International Journal of Engineering Education*, Vol. 27, No. 6, October 2011, pp. 1160-1163.

Howe, S., Caves, K., Kleiner, C., Livesay, G., Norback, J.S., Rogge, R., Turner, C., and Utschig, T. "Nifty Ideas and Surprising Flops in Capstone Design Education," *International Journal of Engineering Education*, Vol. 27, No. 6, October 2011, pp. 1174-1185.

McCormack, J., Beyerlein, S., Brackin, P., Davis, D., Trevisan, M., Davis, H., Lebeau, J., Gerlick, R., Thompson, P., Kahn, M.J., Leiffer, P., and Howe, S. "Assessing Professional Skill Development in Capstone Design Courses," *International Journal of Engineering Education*, Vol. 27, No. 6, October 2011, pp. 1308-1323.

Davis, D., Trevisan, M., Davis, H., Gerlick, R., McCormack, J., Beyerlein, S., Thompson, P., Howe, S., Leiffer, P., and Brackin, P. "Assessing Team Member Citizenship in Capstone Engineering Design Courses," *International Journal of Engineering Education*, Vol. 26, No. 4, August 2010, pp. 771-783.

Howe, S. "Where Are We Now? Statistics on Capstone Courses Nationwide," *Advances in Engineering Education*, Vol. 2, No. 1, Spring 2010.

Riley, D., Howe, S., Reinhardt, N., Lane, P., and Farris, J. "Design for Economic Empowerment: Student Engagement and Learning across Cultures and Disciplines," *Practice and Evidence of the Scholarship of Teaching and Learning in Higher Education*, Vol. 4, No. 2, October 2009, pp. 147-172.

- Eighmy, T., Cook, R., Gress, D., Coviello, A., Spear, J., Hover, K. C., Pinto, R., Hobbs, S., Kosson, D., Sanchez, F., van der Sloot, H., Korhonen, C., Simon, M. "Use of Accelerated Aging to Predict Behavior of Recycled Materials in Concrete Pavements: Physical and Environmental Comparison of Laboratory Aged Samples with Field Pavements," *Transportation Research Record, No. 1792*, 2002, pp.118-128.
- Pinto, Roberto C. A., Hobbs, S. V, and Hover, K. C. "The Maturity Approach in Concrete Technology - Going Beyond Compressive Strength," *ACI/Recent Advances in Concrete Technology*, ACI SP200, 2001, pp. 749-768.
- Livingston, R. A., Aderhold, H. C., Hover, K. C., Hobbs, S. V., and Cheng, Y. T. "Autoradiographic Methods for Identifying Alkali-Silica Reaction Gel," *Cement, Concrete, and Aggregates*. Vol. 22, No. 1, June 2000, pp. 37-40.
- Pinto, R. C. A., Hobbs, S. V., and Hover, K. C., "The Development of Non-Evaporable Water Content and Hardened Properties of High-Performance Mixtures," *High Performance Concrete*, SP-189, American Concrete Institute, Detroit, 1999, pp. 351-366.

CONFERENCE PUBLICATIONS (PEER-REVIEWED)

- Moriarty, M., Howe, S., and Yasinski, E. "Job Shadowing: Improving Interest and Persistence for Women in Engineering," *Proceedings of the American Society for Engineering Education Conference*, June 2013.
- Stanfill, R. K. and Howe, S. "Roughly Right and Fast: Back-of-the-Envelope Calculations for Estimation, Problem Bounding, and Design Decisions," *Proceedings of the International Conference on Engineering Education*, July/August 2012.
- Paretti, M., Howe, S., Blair, S., Rogers, P., Kanai, J., Stanfill, R. K., Livesay, G. "Capstone Design Hub: Building the Capstone Design Community," *Proceedings of the American Society for Engineering Education Conference*, June 2012.
- Trevisan, M., Davis, D., Beyerlein, S., McCormack, J., Thompson, P., Leiffer, P., Davis, H., Howe, S., LeBeau, J., Gerlick, R., Brackin, P., and Khan, J. "Integrated Design Engineering Assessment and Learning System (IDEALS)," *Proceedings of the American Society for Engineering Education Conference*, June 2012. [awarded Best Paper from the Design in Engineering Education Division]
- Howe, S., Moriarty, M., and Errabelli, A. "Transfer from Capstone Design: A Model to Facilitate Student Reflection," *Proceedings of the American Society for Engineering Education Conference*, June 2011.
- Davis, D., Trevisan, M., Davis, H., Gerlick, R., McCormack, J., Beyerlein, S., Thompson, P., Howe, S., Brackin, P., and Khan, J. "Assessing Professional Skill Development in Capstone Design Courses," *Proceedings of the 2010 Capstone Design Conference*, June 2010.
- McCormack, J., Beyerlein, S., Feldon, D., Davis, D., Davis, H., Wemlinger, Z., Gerlick, R., and Howe, S. "Methodology for Selection, Sequencing, and Deployment of Activities in a Capstone Design Course Using the TIDEE Web-Based Assessment System," *Proceedings of the Design Education Technical Conference of the American Society of Mechanical Engineers*, August 2009.
- Howe, S., Lasser, R., Su, K., and Pedicini, S. "Content in Capstone Courses: Pilot Results from Faculty, Students, and Industry," *Proceedings of the American Society for Engineering Education Conference*, June 2009.

- Davis, D., Beyerlein, S., Thompson, P., McCormack, J., Harrison, O., Trevisan, M., Gerlick, R., and Howe, S. "Assessing Design and Reflective Practice in Capstone Engineering Design Courses," *Proceedings of the American Society for Engineering Education Conference*, June 2009.
- Howe, S. "Focused Follow-Up to 2005 National Capstone Survey," *Proceedings of the American Society for Engineering Education Conference*, June 2008.
- Farris, J., Lane, P., Howe, S., Riley, D., and Reinhardt, N. "Opportunity Identification Across Cultures and Disciplines," *Proceedings of the United States Association of Small Business and Entrepreneurship Conference*, January 2008.
- Howe, S., Riley, D., Farris, J., Lane, P., and Reinhardt, N. "Work In Progress – Designing for Economic Empowerment in Nicaragua," *Proceedings of the Frontiers in Education Conference*, October 2007.
- Wilbarger, J. and Howe, S. "Current Practices in Engineering Capstone Education: Further Results from a 2005 Nationwide Survey," *Proceedings of the Frontiers in Education Conference*, October 2006.
- Howe, S. and Wilbarger, J. "2005 National Survey of Engineering Capstone Design Courses," *Proceedings of the American Society for Engineering Education Conference*, June 2006.
- Farris, J., Goodrich, J., Howe, S., Kussmaul, C., and Weissbach, R. "Facilitating Entrepreneurship Education at Primarily Undergraduate Institutions," *Proceedings of the American Society for Engineering Education Conference*, June 2006.
- Kussmaul, C., Howe, S., Arion, D., Farris, J., Goodrich, J., Lane, P., Lehman, M., Levenburg, N., Kundrat, M., Secor, M., Twitchell, C., Way, L., and Weissbach, R. "Institutionalizing Entrepreneurship at Primarily Undergraduate Institutions," *Proceedings of the National Collegiate Inventors and Innovators Alliance Conference*, March 2006.
- Howe, S. "Lessons Learned: The Inaugural Engineering Design Clinic at Smith College," *Proceedings of the International Conference on Engineering Education*, October 2004.
- Riley, D., Ellis, G., and Howe, S. "'To Move People from Apathy': A Multi-Perspective Approach to Ethics Across the Engineering Curriculum," *Proceedings of the American Society for Engineering Education Conference*, June 2004.
- Ganz, A., Howe, S., Rivera, V., and Chu, Y., "Breaking the Silicon Ceiling: Women in Engineering Freshman Seminar," *Proceedings of the 2003 Frontiers in Education Conference*, November 2003.
- Hobbs, S. V., Holland-Minkley, A. M., and Millett, L. I. "A Case for Building Inclusive Research Communities as an Integral Part of Science and Engineering Graduate Education," *Proceedings of the 1999 International Symposium on Technology and Society*, IEEE, July 1999.
- Hobbs, S. V., Pinto, R. C. A., and Hover, K. C. "Further Studies on the Relationship between Non-Evaporable Water Content and Compressive Strength in High Performance Mixtures," *Proceedings of the Fifth International Symposium on Utilization of High Strength/High Performance Concrete*, Sandefjord, Norway, June 1999, vol. 2, pp. 1154-1163.

OTHER PUBLICATIONS

- Eighmy, T.T., Cook, R.A., Gress, D.L., Coviello, A.D., A.D.; Spear, Hover, K.C., Pinto, R., Hobbs, S., Kosson, D.S., Sanchez, F., van der Sloot, H.A., Korhonen, C.J. "A Predictive Approach for Long-Term Performance of Recycled Materials Using Accelerated Aging," Federal Highway Administration Grant # DTFH61-97-X-00021, *USDOT-FHWA/Main Report; FHWA-RD-01-022*, vol. 1, 2001.
- Pinto, R. C. A., Hobbs, S. V., and Hover, K. C. *Accelerated Aging of Concrete: A Literature Review*. Report to Accompany the Final Report from the Federal Highway Administration Grant # DTFH61-97-X-00021, submitted to the Federal Highway Administration in November 2000.
- Hobbs, S. V. *A Study of Non-Evaporable Water Content in Cement-Based Mixtures with and without Pozzolanic Materials*. Ph.D. Thesis, Cornell University, August 2000.
- The Engineering Graduate Student Association Handbook*. ed. by S. V. Hobbs and L. I. Millett, EGSA, Cornell University, v. 1.0, August 1999.

CONFERENCE WORKSHOPS/PRESENTATIONS

- Livesay, G., Rogge, R., Howe, S., Rogers, P., and Goldberg, J. "Planning Session: 2014 Capstone Design Conference," American Society for Engineering Education Conference, Session M723, June 2013.
- Howe, S. and Moriarty, M. "Presentation: Job Shadowing: New Perspectives, News Ideas, New Interest," Conference for Industry and Education Collaboration, February 2013.
- Howe, S. and Moriarty, M. "Presentation: Job Shadowing: New Perspectives, News Ideas, New Interest," Society for Women Engineers National Conference, November 2012.
- Blair, S., Howe, S., Rogers, P., Kanai, J., Stanfill, K., and Livesay, G. "Workshop: Capstone Design Hub: Building an Online Resource Center for the Capstone Community," Capstone Design Conference, May/June 2012.
- Lee, M., Kriewall, T., Howe, S., Huang-Saad, A. "Panel: Lessons Learned from Failed Entrepreneurship Initiatives on College Campuses," National Collegiate Inventors and Innovators Alliance Conference, March 2012.
- Getzler-Linn, L., Duval-Couteil, N., Howe, Barrow, A., Howe, S. "Panel: Where Are the Women?" National Collegiate Inventors and Innovators Alliance Conference, March 2012.
- Howe, S., Rogers, P., Goldberg, J., and Stanfill, K. "Planning Session: 2012 Capstone Design Conference," American Society for Engineering Education Conference, Session T721, June 2011.
- Howe, S. and Moriarty, M. "Workshop: Assessment Methodology: Transferable Skills and the Capstone Experience," RosEvaluation Conference, April 2011.
- Howe, S. "Presentation: Nifty Idea: Back-of-the-Envelope Calculations," Capstone Design Conference, June 2010.
- Howe, S., Palo, S., and Stanfill, K. "Planning Session: National Capstone Design Conference 2010," American Society for Engineering Education Conference, Session 2725, June 2009.

- Kussmaul, C. and Howe, S. "Workshop: Addressing the Grand Challenges in Entrepreneurship Education using Open Space," National Collegiate Inventors and Innovators Alliance Conference, March 2009.
- Lane, P., Farris, J., Lehman, M., Howe, S., Kussmaul, C., and Arion, D. "Panel: Primarily Undergraduate Institution Track: Applications Across the Stage-Gate Model," National Collegiate Inventors and Innovators Alliance Conference, March 2007.
- Howe, S. and Kussmaul, C. "Presentation: Using Wikis to Foster Team Communication, Cohesion, and Collaboration," American Society for Engineering Education Conference, June 2006.
- Howe, S. and Kussmaul, C. "Workshop: Fostering Collaboration in Heterogeneous Teams," Consortium for Computing Sciences in Colleges, New England Regional Conference, April 2006.
- Howe, S. and Kussmaul, C. "Workshop: Fostering Collaboration in Heterogeneous Teams," National Collegiate Inventors and Innovators Alliance Conference, March 2006.
- Howe, S., Farris, J., Kussmaul, C., Lehman, M., and Way, L. "Workshop: Encouraging Entrepreneurship at Primarily Undergraduate Institutions," United States Association of Small Business and Entrepreneurship Conference, January 2006. (Best workshop finalist)
- Howe, S. "Designing a Capstone Engineering Course: A Discussion of the Engineering Design Clinic," Sigma Xi Lecture Series at Smith College, 6 April 2004.

INVITED PRESENTATIONS

- "The Picker Engineering Program at Smith College: Opportunities for Connection and Collaboration," invited lecture for the Smith Club of Worcester, MA, 25 October 2012.
- "The Picker Engineering Program at Smith College: Opportunities for Connection and Collaboration," invited lecture at the *Specialist to Strategist Program*, Smith Executive Education, 7 June 2012.
- "Engineering Capstone Design at Smith College: An Opportunity for Application and Collaboration," invited lecture at the Global Education Center for Engineers, Seoul National University, Seoul, Korea, 12 December 2011.
- "Engineering Pioneers: The Picker Engineering Program at Smith College," keynote presentation for the regional meeting of the American Association of University Women, 9 May 2009.
- "On-Ramp Your Career: Understanding Obstacles and Maximizing Opportunities for Your Comeback," Honeywell-sponsored panel presentation at the *Society of Women Engineers National Conference*, 6 November 2008.
- "Where Are We Now? Statistics on Capstone Courses Nationwide," keynote presentation for the inaugural National Capstone Design Course Conference, 13 June 2007.
- "Engineering Design: From Curriculum to Clinic," invited lecture for the Darian/New Canaan Smith Club, 8 May 2007.
- "The Engineering Design Clinic," invited lecture at the *Specialist to Strategist Program*, Smith Executive Education, 8 June 2006.

"Engineering Design: From Curriculum to Clinic," invited lecture for the Indianapolis Smith Club, 12 May 2006.

"Smith College: PVTIDE Academic Partner," invited presentation for the Pioneer Valley Technology Innovation Development Exchange Innovators Round Table Meeting, 16 November 2005.

"Paving the Way: Smith College, the Picker Engineering Program, and Public Works," invited lecture at the American Public Works Association regional meeting, 11 May 2005.

"The Materials of Structural / The Structure of Materials," invited lecture at Smith College, EGR 101, 12 November 2002.

"Where's the Water? A Fresh Look at Cement Hydration via Measurement of Non-Evaporable Water Content," invited lecture at Princeton University, Department of Civil and Environmental Engineering, 7 November 2000.

"Application of the Maturity Approach to the Development of Degree of Hydration and Mechanical Properties of Mortar Mixtures," oral presentation at the American Ceramic Society Annual Meeting, 25-28 April 1999, Indianapolis, Indiana, Paper #T-028-99.

"A Sensitivity Study of a Loss on Ignition Procedure Used to Assess Non-Evaporable Water Content of Cement Mortars," poster presentation at the American Ceramic Society Annual Meeting, 25-28 April 1999, Indianapolis, Indiana, Poster TP-007-99.

PROFESSIONAL SERVICE

Program Chair: Design in Engineering Education Division, American Society for Engineering Education Annual Conference and Exposition (June 23-26, 2013: Atlanta, GA).

Conference Co-Chair: 2012 Capstone Design Conference (May 30-June 1, 2012: Champaign-Urbana, IL) and 2010 Capstone Design Conference (June 7-9, 2012: Boulder, CO).

Grant Reviewer: National Science Foundation (CCLI, STEP, TUES, and IRES programs) and National Collegiate Inventors and Innovators Alliance (Course & Program and Sustainable Vision grants)

Guest Editor: *International Journal of Engineering Education*: special issues for the 2012 and 2010 Capstone Design Conferences

Journal Reviewer: *Journal of Mechanical Design*; *Advances in Engineering Education*; *Engineering Studies*; *International Journal of Engineering Education*; *International Journal of Engineering, Social Justice, and Peace*

Conference Paper Reviewer: American Society for Engineering Education Conference, Capstone Design Conference, Frontiers in Education, National Collegiate Inventors and Innovators Alliance, American Society of Mechanical Engineering - Design Engineering Technical Conference, United States Association for Small Business and Entrepreneurship Conference

OUTREACH

STEM-RAYS – University of Massachusetts at Amherst / National Science Foundation

Faculty mentor for middle school teachers leading after-school clubs on engineering design
September 2009 – June 2010 (seven teachers, nine clubs)
September 2008 – June 2009 (five teachers, six clubs)

National Girls Collaborative Project – Collaboration Forum

Invited panelist: Collaborative Programs, 19 November 2009

Young Women in Science Summer Program

Invited seminar: "Engineering Design," 2 August 2011, 4 August 2009, and 5 August 2005
Invited seminar: "Structures and Materials," 2 August 2011 and 1 August 2006
Invited seminar: "The Behavior of Structural Materials," 5 August 2003

Northampton High School – AP Chemistry

Invited seminar: "Engineering Design," 3 June 2009, 12 June 2007, 17 June 2005

Summer Science and Engineering Program – Smith College

Two-week intensive course for high school girls: "Engineering Design and Assistive Technology," 3-14 July 2006

Science and Engineering Saturday Program – University of Massachusetts, Amherst

Invited seminar for middle school teachers: "Bridges," 1 March 2003

Graduate Student Outreach Program – Cornell University/Trumansburg Middle School

Short-course for 6th grade students: "Alternative Construction Around the World," Spring 1999

SYMPOSIA PARTICIPATION

Specialist to Strategist. 5-10 June 2011, Smith College Executive Education, Northampton, MA.

Teaching Multidisciplinary Teamwork. 17-18 July 2008, Rensselaer Polytechnic Institute, Troy, NY.

Summer Institute for Material Science and Material Culture. 9-22 June 2002, Massachusetts Institute of Technology, Cambridge, MA.

The National Science Foundation Engineering Education Scholars Workshop: Preparing Engineering Faculty of the Future in Research, Teaching, and Mentoring. 18-23 July 1999, Carnegie Mellon Univ., Pittsburgh, PA.

Natural Building Materials Colloquium East: Lectures and Demonstrations of Strawbale, Bamboo, Cob, and other Natural and Alternative Construction Practices. 14-20 June 1998, Davidsonville, MD.