

# Susannah V. Howe, Ph.D., P.E.

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## 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<br>Senior Lecturer (2011-present)<br>Lecturer (2006-2011)<br>Visiting Asst. Prof. (2003-2006) | <b>Smith College</b><br>Picker Engineering Program                                 |
| 2020 – 2023    | Class Dean<br>Junior Class Dean (2022-2023)<br>Sophomore Class Dean (2020-2022)                                      | <b>Smith College</b><br>Class Deans Office   |
| 2020           | R&D Consulting Engineer  | <b>Cofab Design</b>  |
| 2013 – 2014    | Faculty Fellow (sabbatical rotation)   | <b>Covidien</b>  |
| 2010 – 2012    | R&D Engineer   | <b>Protopeutics, Inc.</b>  |
| 2007 – 2009    | Consulting Engineer  | <b>Page Product Design</b>   |
| 2002 – 2003    | Visiting Assistant Professor   | <b>University of Massachusetts, Amherst</b><br>Civil and Environmental Engineering |
| 2002           | Special Projects Coordinator   | <b>University of Massachusetts, Amherst</b><br>Women in Engineering Program        |
| 2000 – 2001    | Professional Development Associate   | <b>Cornell University</b><br>College of Engineering                                |
| 2000 – 2001    | Laboratory Co-Instructor   | <b>Cornell University</b><br>Civil and Environmental Engineering                   |
| 1996 – 2000    | Graduate Research Assistant  | <b>Cornell University</b><br>Civil and Environmental Engineering                   |
| Summer 1997    | Research Assistant   | <b>NIST</b><br>Building and Fire Research Laboratory                               |
| Summer 1994    | Construction Management Intern   | <b>Boston Central Artery/Third Harbor Tunnel Project</b>                           |

## 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 (capstone design studio course)  
Engineering Design and Professional Practice (capstone design lecture course)  
Applied Design and Prototyping (co-instructor, intensive short course)  
Introduction to Entrepreneurship I and II (co-instructor, intensive short courses)  
Economics of Innovation (co-instructor)  
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

Rudolph J. Joenk Award for the Best Paper in the *IEEE Transactions on Professional Communication* in 2021

CoVent-19 Challenge Ventilator Design Winner (2020) - *co-led a team of 30 Smith alumni, faculty, and staff on the design of an open-source ventilator for COVID-19 patients*

Professional Engineering License (2020) – Wyoming #17968

NCEES Engineering Education Award (2019) - Design Clinic/Northampton DPW project team - *for integrating professional practice and engineering education*

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 - Civil & Environmental Eng., Cornell University

George Winter Graduate Fellowship - Structural Engineering, Cornell University

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

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/CONSULTING

Coordinator: Funding for capstone Design Clinic course and projects: >\$1.1M to date supporting 143 projects from 2003-present.

Advisory Board Member: Project ExCEED: "Exploring Culturally relevant Engineering Education Design", *National Science Foundation*, January 2021-December 2023.

Capstone Design Departmental Coach: Wake Forest University (newly established engineering program), July 2020-January 2021.

Assessment Consultant/Panelist: "Ethics Advisory Panel" and "Creative and Critical Thinking Panel", *Project Lead the Way*, April 2019-November 2020

Co-Principal Investigator: "Collaborative Research: From School to Work: Understanding the Transition from Education Capstone Design to Industry," *National Science Foundation*, September 2016 – August 2020, \$65,196 (Smith portion).

Engineering Design Consultant: "Managing Small Groups to Meet the Social and Psychological Demands of Scientific and Engineering Practices in High School Science," *National Science Foundation*, September 2013-August 2016, PIs: M. Nieswandt and E. McEaney, UMass Amherst.

Acting Principal Investigator (as of Feb 2013): "E-Book Dissemination of Curricular and Pedagogical Innovations in Thermodynamics," *National Science Foundation*, February 2011-January 2015, \$145,993.

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 Principal Investigator: "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.**, Ory, E., Carroll, D., Chu, S., Clarke, K., Dalton, B., Dudek, C., Horne, A., Howe, N., Kazi, S., Landeau, A., Lin, D., DeGroot, P., Dixon, E., Sabry, F., and Widstrand, A. "The SmithVent Experience and a Framework for Collaborative Distributed Design and Fabrication," *International Journal of Engineering Education*, Vol. 38, No. 6, November 2022, pp. 1904-1922.

Ford, J., Paretto, M., Kotys-Schwartz, D., **Howe, S.**, and Ott, R. "New Engineers' Transfer of Communication Activities from School to Work," *IEEE Transactions on Professional Communication*, Vol. 64, No. 2, June 2021, pp. 105-120. [Rudolph J. Joenk Award for Best Paper]

- Paretti, M., Kotys-Schwartz, D., Ford, J., **Howe, S.**, and Ott, R. "Leveraging the Design Process to Build Self-Directed Learning," *International Journal of Engineering Education*, Vol. 36, No. 2, March 2020, pp. 664-674.
- Howe, S.**, Smyser, B., Hart, R., and Stanfill, R. "Guest Editorial: The 2018 Capstone Design Conference," *International Journal of Engineering Education*, Vol. 35, No. 6B, November 2019, pp. 1883-1887.
- Estell, J., **Howe, S.**, Jaeger-Helton, B., Sangelkar, S., Kinzli, K., and Rand, D. "Client Interaction Tools: Supporting Student Professionalism on Client-Based Capstone Design Projects," *International Journal of Engineering Education*, Vol. 35, No. 6B, November 2019, pp.1953-1968.
- Ford, J., Paretti, M., Kotys-Schwartz, D., **Howe, S.**, Gewirtz, C., Deters, J., Chowdhury, T., Ott, R., Alvarez, N., Knight, D., Hernandez, C., Rosenbauer, L., Kary, A., and Giardine, F. "Transitioning from Capstone Design Courses to Workplaces: A Study of New Engineers' First Three Months," *International Journal of Engineering Education*, Vol. 35, No. 6B, November 2019, pp.1993-2013.
- Howe, S.** and Goldberg, J. "Engineering Capstone Design Education: Current Practices, Emerging Trends, and Successful Strategies," *Design Education Today: Technical Contexts, Programs and Best Practices*, D. Schaefer et al (Eds.), Springer International Publishing, 2019, pp. 115-148, DOI: 10.1007/978-3-030-17134-6.
- Howe, S.** "Cultivating the Capstone Ecosystem to Educate the Engineer of 2020," *International Journal of Engineering Education*, Vol. 34, No. 2B, March 2018, pp. 653-658.
- Howe, S.**, Rosenbauer, L., and Poulos, S. " The 2015 Capstone Design Survey Results: Current Practices and Changes over Time," *International Journal of Engineering Education*, Vol. 33, No. 4, November 2017, pp. 1393-1421.
- Brackin, P., **Howe, S.**, Rogers, P., Stanfill, R., Beyerlein, S., Kanai, J., Vallino, J., and Palo, S. "Guest Editorial: The 2016 Capstone Design Conference," *International Journal of Engineering Education*, Vol. 33, No. 4, November 2017, pp. 1388-1392.
- Beyerlein, S., Goldberg, J., **Howe, S.**, Palo, S., Rogge, R., and Stanfill, R. "Guest Editorial: The 2014 Capstone Design Conference," *International Journal of Engineering Education*, Vol. 31, No. 6B, November 2015, pp. 1723-1726.
- Goldberg, J. and **Howe, S.** "Virtual Capstone Design Teams: Preparing for Global Innovation," *International Journal of Engineering Education*, Vol. 31, No. 6B, November 2015, pp. 1773-1779.
- Howe, S.**, Goldberg, J., Palo, S., and Rogers, P. "Guest Editorial: The 2012 Capstone Design Conference," *International Journal of Engineering Education*, Vol. 30, No. 1, January 2014, pp. 1-5.
- Norback, J., Rhoad, P., **Howe, S.**, and Riley, L. "Student Reflections on Capstone Design: Experiences with Industry-Sponsored Projects," *International Journal of Engineering Education*, Vol. 30, No. 1, January 2014, pp. 39-47
- LeBeau, J., Trevisan, M., McCormack, J., Beyerlein, S., Davis, D., Leiffer, P., Thompson, P., Davis, H., **Howe, S.**, Brackin, P., Gerlick, R., and Kahn, M.J. " Alumni Perspective on Professional Skills Gained Through

Integrated Assessment and Learning," *International Journal of Engineering Education*, Vol. 30, No. 1, January 2014, pp. 48-59.

**Howe, S.**, Goldberg, J., Palo, S., and Terpenney, J. "Guest Editorial: The 2010 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, R., **Hobbs, S.**, and Hover, K. "The Maturity Approach in Concrete Technology - Going Beyond Compressive Strength," *ACI/Recent Advances in Concrete Technology*, ACI SP200, 2001, pp. 749-768.

Livingston, R., Aderhold, H., Hover, K., **Hobbs, S.**, and Cheng, Y. "Autoradiographic Methods for Identifying Alkali-Silica Reaction Gel," *Cement, Concrete, and Aggregates*. Vol. 22, No. 1, June 2000, pp. 37-40.

Pinto, R., **Hobbs, S.**, and Hover, K., "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)

**Howe, S.** "Collaboration, Professional Preparation, and Personal Growth: Alum Validation of Capstone Design Outcomes," *Proceedings of the Mudd Design Workshop XIII*, June 2023.

Rubin, A., **Howe, S.**, and Kinsinger M. "Implementing Individual Performance Reviews in an Engineering Capstone Design Course," *Proceedings of the 2022 Capstone Design Conference*, June 2022.

- Jaeger-Helton, K., **Howe, S.**, and Estell, J. "Meeting the Client: Learning the Capstone Student's Perspective through the Three-Intelligences Methodology," *Proceedings of the 2022 Capstone Design Conference*, June 2022.
- Paretti, M., Ford, J., **Howe, S.**, Kotys-Schwartz, D., and Ott, R. "It's a Context Gap, Not a Competency Gap: Understanding the Transition from Capstone Design to Industry," *Proceedings of the American Society for Engineering Education Conference*, July 2021.
- Howe, S.**, Ory, E., Carroll, D., Chu, S., Clarke, K., Dudek, C., Horne, A., Howe, N., Kazi, S., Landeau, A., Lin, D., Dalton, B., DeGroot, P., Dixon, E., and Sabry, F. "Successful Strategies for Remote Making: A Case Study of the SmithVent Experience," *Proceedings of the Mudd Design Workshop XII*, May 2021.
- Howe, S.**, Ott, R., Paretti, M. C., Hernandez, C., Deters, J., Gewirtz, C., Giardine, F., and Kary, A. "Women's Experiences in the Transition from Capstone Design Courses to Engineering Workplaces," *Proceedings of the American Society for Engineering Education Conference*, June 2019.
- Paretti, M. C., Kotys-Schwartz, D., Ford, J., **Howe, S.**, and Ott, R. "Process Matter(s): Leveraging the Design Process to Build Self-Directed Learning," *Proceedings of the May 2019. Proceedings of the Clive L. Dym Mudd Design Workshop XI*, May 2019.
- Gewirtz, C., Kotys-Schwartz, D., Knight, D., Paretti, M., Arunkumar, S., Ford, J., **Howe, S.**, Rosenbauer, L., Alvarez, N., Deters, J., and Hernandez, C. "New Engineers' First Three Months: A Study of the Transition from Capstone Design Courses to Workplaces," *Proceedings of the American Society for Engineering Education Conference*, June 2018.
- Estell, J., **Howe, S.**, and Jaeger-Helton, K. "Client Interaction Rubrics: Supporting Student Professionalism on Client-Based Projects," *Proceedings of the 2018 Capstone Design Conference*, June 2018.
- Howe, S.**, Rosenbauer, L., Ford, J., Alvarez, N., Paretti, M., Gewirtz, D., Kotys-Schwartz, D., Knight, D., and Hernandez, C. "Preliminary Results from a Study Investigating the Transition from Capstone Design to Industry," *Proceedings of the 2018 Capstone Design Conference*, June 2018.
- Paretti, M., Kotys-Schwartz, D., **Howe, S.**, Ford, J., Lutz, B., Kochersberger, K., Gewirtz, C., Rosenbauer, L. M., Arunkumar, S. "From School to Work: Understanding the Transition from Capstone Design to Industry," *Proceedings of the American Society for Engineering Education Conference*, June 2017.
- Howe, S.** and Rosenbauer, L. "Extending the 2015 Capstone Design Survey: Data from Australia and New Zealand," *Proceedings of the American Society for Engineering Education Conference*, June 2017.
- Estell, J. and **Howe, S.** "Development and Use of a Client Interaction Rubric for Formative Assessment," *Proceedings of the American Society for Engineering Education Conference*, June 2017.
- Howe, S.** "Cultivating the Capstone Ecosystem to Educate the Engineer of 2020," *Proceedings of the Mudd Design Workshop X*, June 2017.
- Howe, S.**, Poulos, S., and Rosenbauer, L. "The 2015 Capstone Design Survey: Observations from the Front Lines," *Proceedings of the American Society for Engineering Education Conference*, June 2016.
- Howe, S.**, Rosenbauer, L., and Poulos, S. "2015 Capstone Design Survey: Initial Results," *Proceedings of the 2016 Capstone Design Conference*, June 2016.
- Guo, M., Nieswandt, M., McEneaney, E., and **Howe, S.** "The Influence of Gender Grouping in Design-Based Science on High School Girls' Biology Engagement," *Proceedings of the American Educational Research Association Annual Meeting*, April 2016.

- Guo, M., Nieswandt, M., McEneaney, E., and **Howe, S.** "Students' Engagement in Different Steps of the Engineering Design Process in a Design-Based Biology Activity," *Proceedings of the National Association for Research in Science Teaching Annual Meeting*, April 2016.
- Howe, S.**, Poulos, S., and Stanfill, R., "CDHub 2.0: Laying the Foundation for an Online Repository for Capstone Design," *Proceedings of the American Society for Engineering Education Conference*, June 2015.
- Howe, S.** "Industry Immersion: The Impacts of a Sabbatical Deep-Dive," *Proceedings of the American Society for Engineering Education Conference*, June 2015.
- Mikic, B., **Howe, S.**, Stables, F., Middlebrook, J., Hauser, A., Aiken, C., Bertone Johnson, R., and Mendelowitz, E. "Design Thinking and the Liberal Arts: a Cross-Campus Initiative at Smith College," *Proceedings of the Mudd Design Workshop IX*, May 2015.
- Goldberg, J. and **Howe, S.** "Virtual Capstone Design Teams: Preparing for Global Innovation," *Proceedings of the 2014 Capstone Design Conference*, June 2014.
- 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]
- Davis, D., Beyerlein, S., Trevisan, M., Thompson, P., **Howe, S.**, Davis, H., McCormack, J., Brackin, P., Kahn, M.J., and Leiffer, P. "IDEALS for Professional Skills Achievement and Assessment," *Proceedings of the 2012 Capstone Design Conference*, May/June 2012.
- 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.**, Holland-Minkley, A., and Millett, L. "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.**, Pinto, R., and Hover, K. "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

- Howe, S.** *Design Clinic Download Podcast*, Episodes 1-10, September 2022-April 2023.  
<[bit.ly/designclinicdownload](https://bit.ly/designclinicdownload)>



**Howe, S.**, Landeau, A., et al. "SmithVent: Design Documentation for a Rapidly-Manufacturable, Open-Source Ventilator for COVID-19 Patients," June 2020. <tinyurl.com/smithvent>

Paretti, M., Ford, J., **Howe, S.**, and Kotys-Schwartz, D. "Engineering Capstone Courses Help Students Transition from School to Work," *Research Outreach*, November 2019. DOI: 10.32907/RO-110-5861

Tranquillo, J., Akera, A., Cheville, A., Cutler, S., Estell, J., Goodman, K., Henderson, G., **Howe, S.**, Kennedy, T., Killgore, M., Marcus, I., Meier, R., Modenbach, A., Olson, R., Pawley, A., and Tingerhal, J. *ASEE Conference Playbook: Co-Created Sessions from the 2019 ASEE Town Hall*, August 2019.

**Howe, S.** "Capturing the Big Picture: The 2015 Capstone Design Survey," Last Word Article, *Resource*, September/October 2016.

Goldberg, J. with **Howe, S.** "Faculty Internships for Capstone Design Instructors: Maintaining an up-to-date Capstone Design Course," Editorial Blog, *IEEE Pulse*, May/June 2014.

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., **Hobbs, S.**, and Hover, K. *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.** *A Study of Non-Evaporable Water Content in Cement-Based Mixtures with and without Pozzolan Materials*. Ph.D. Thesis, Cornell University, August 2000.

*The Engineering Graduate Student Association Handbook*. ed. by **S. Hobbs** and L. Millett, EGSA, Cornell University, v. 1.0, August 1999.

## CONFERENCE WORKSHOPS/PRESENTATIONS

**Howe, S.** "Presentation: Nifty Idea: Alum Voices through a Capstone Podcast," Capstone Design Conference, June 2023.

Baker, T., **Howe, S.**, Penagos, A., Topp, K. "Faculty Advising: Issues, Solutions, Models, Lessons Learned," COFHE Advising Deans Conference, March 2023.

Paretti, M., Howe, S., and Kotys-Schwartz, D. "The Transfer from Capstone to Work: Insights and Implications," Capstone Design Conference, June 2022.

Jaeger-Helton, K. and **Howe, S.** "Harnessing the Three Intelligences Methodology to Guide Student Ownership, Collaboration and Delivery in Capstone," Capstone Design Conference, June 2022.

**Howe, S.** "Panel: Introduction to Capstone Design Research," Capstone Design Conference, June 2022.

**Howe, S.** "Panel: Undergraduate Education in Manufacturing," NAE/NMMB Workshop on Infusing Advanced Manufacturing in Engineering Education, February 2022.

Paretti, M., Howe, S., and Kotys-Schwartz, D. "Workshop: Putting Students to Work: Using Findings From a Multi-University Study of Engineers' First Year of Work to Enhance Design Education," American Society for Engineering Education Conference, July 2021.

- Howe, S.** "Presentation: Nifty Idea: Scavenger Hunt for Reflection and Transfer," Capstone Design Conference, June 2021.
- Howe, S.** "Panel: Capstone 101," Capstone Design Conference, July 2020.
- Howe, S.** "Presentation: Nifty Idea: Alumni Lifelines," Capstone Design Conference, June 2018.
- Howe, S.** "Panel: Capstone 101," Capstone Design Conference, June 2018.
- Howe, S.** "Presentation: The 2015 Capstone Design Decennial Survey: Current Practices and Trends over Time," New England/New York Regional Capstone Workshop, June 2017.
- Lutz, B., Gewirtz, C., Paretto, M., Ford, J., Arunkumar, S., Kotys-Schwartz, D., **Howe, S.**, Rosenbauer, L. (2017). "Poster Presentation: Into the Workplace: Innovative Approaches to Exploring Entry-Level Engineers' Learning and Transfer," Mudd Design Workshop X, June 2017.
- Howe, S.** "Presentation: Nifty Idea: Design Project Videos," Capstone Design Conference, June 2014.
- 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.
- Kusmaul, 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 SmithVent Ventilator Development Process," invited lecture (with Astrid Landeau '15) for Ximedica, 21 August 2020.

"The SmithVent Ventilator Design: A Case Study of Distributed Innovation and Volunteer Collaboration," invited lecture (with Astrid Landeau '15) for the MIT Innovation Lab quarterly meeting, 28 July 2020.

"Project Showcase: SmithVent," invited short presentation at *Vent-Con 2020: Quality Assurance and Regulatory Compliance*, 16 July 2020.

"Changing the Face of Engineering: How Smith Prepares Its Engineering Students for Success," invited lecture for the Smith Club of Cleveland, OH, 7 November 2019.

"The Picker Engineering Program at Smith College: Opportunities for Connection and Collaboration," invited lecture (with Kristen Dorsey) at Facebook, Menlo Park, CA, 19 June 2018.

"The 2015 Capstone Design Decennial Survey," keynote presentation for the 2016 Capstone Design Conference, 6 June 2016.

"The Picker Engineering Program at Smith College: An Opportunity for Application and Collaboration," invited lecture at Instrumentation Laboratory, Bedford, MA, 16 March 2016.

"Women in Technology: How Smith Prepares Its Engineering Students for Success," invited lecture for the Smith Club of Sarasota, FL, 13 February 2016.

"The Picker Engineering Program at Smith College: An Opportunity for Application and Collaboration," invited lecture at Evoqua Water Technologies, Lowell, MA, 28 April 2012.

"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**

Communications Chair: 2023 Capstone Design Conference (June 14, 2023: virtual session), 2022 Capstone Design Conference (June 6-8, 2022, Dallas, TX), 2021 Capstone Design Conference (June 9, 2021: virtual session), 2020 Capstone Design Conference (July 9, 2020: virtual session), 2018 Capstone Design Conference

(June 4-6, 2018: Rochester, NY), 2016 Capstone Design Conference (June 6-8, 2016: Columbus, OH) and 2014 Capstone Design Conference (June 2-4, 2014: Columbus, OH)

Webmaster and Past Chair: Design in Engineering Education Division, American Society for Engineering Education, 2015-2018.

Division Chair: Design in Engineering Education Division, American Society for Engineering Education, 2014-2015.

Treasurer/Secretary: Design in Engineering Education Division, American Society for Engineering Education, 2013-2014.

Program Chair: Design in Engineering Education Division, American Society for Engineering Education, 2012-2013.

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)

External Program Reviewer: Spelman College Dual Degree Engineering Program (DDEP), April 2023.

Guest Editor: *International Journal of Engineering Education*: special issues for the 2018, 2016, 2014, 2012, and 2010 Capstone Design Conferences

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

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

Book Proposal Reviewer: CRC Press, Routledge Press

Report Reviewer: *Infusing Advanced Manufacturing into Undergraduate Engineering Education*, National Academies, December 2022.

## **INSTITUTIONAL SERVICE**

College Committees: Committee on Faculty Compensation and Development (elected), College Marshals (appointed), Council on Community Policy (appointed)

Advisory Boards: Sherrerd Center for Teaching and Learning, Design Thinking Initiative, Conway Center for Innovation and Entrepreneurship, Program on the Study of Women and Gender, Jandon Center for Community Engagement, Study Abroad

Working Groups: Holistic Assessment of Teaching, Best Practices for Campus Violence Prevention, Short-Term Student Travel Abroad Policy

Search Committees: Director of the Conway Center, Post-Doc in Art and Design Thinking, Director of the Wurtele Center for Leadership, Director of the Design Thinking Initiative, Director of the Lewis Global Studies Center

Departmental Service: Honors and Awards in Engineering, Faculty Advisor to the Smith Society of Women Engineers Chapter

## **OUTREACH**

*John D. O'Bryant School of Mathematics and Science – 11/12th Grade*

Invited presentation: "The SmithVent Design Experience," 18 November 2022

*Springfield Conservatory for the Arts – 6th Grade*

Invited workshop: "Engineering Design," 19 November 2021

*GAINS (Girls Advancing in STEM) Annual Conference*

Invited presentation: "SmithVent", 19 November 2020

*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 workshop: "Engineering Design," 2 August 2018, 4 August 2016, 2 August 2011, 4 August 2009, and 5 August 2005

Invited workshop: "Structures and Materials," 2 August 2011 and 1 August 2006

Invited workshop: "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/SHORT COURSE PARTICIPATION**

Low-Elements Challenge Course Facilitator Training. 17-18 September 2017, High 5 Adventure Learning, Whately, MA.

Team-Based Learning Collaborative Certification. 2-4 March 2017, TBLC Meeting, Orlando, FL.

Lean LaunchPad Educators Seminar. 2-4 November 2015, Venture Well, Santa Cruz, CA.

FDA Design Controls. 2-4 December 2013, Association for the Advancement of Medical Instrumentation, Covidien, North Haven, CT.

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.

## **INDUSTRY VISITS**

2022: Bell (Fort Worth, TX)

2021: Clean Crop Technologies (Haydenville, MA)

2020: Dielectrics (Chicopee, MA)  
Velico Medical (Beverly, MA)

2019: Collins Aerospace (Windsor Locks, CT)  
Arax Engineering (Storrs, CT)  
EnviroPower (Hartford, CT)  
MachineMetrics (Northampton, MA)  
Eli Lilly (Indianapolis, IN)  
Cofab Design (Holyoke, MA)  
Tech180 (Easthampton, MA)  
EA EST (Warwick, RI)  
McMaster-Carr (Elmhurst, IL)  
Eriksson (Chicago, IL)  
Conformis (Wilmington, MA and Billerica, MA)  
Aclarity (Springfield, MA)  
Axcelis (Beverly, MA)  
Arup (Boston, MA)  
Nordson (Amherst, OH)  
STERIS (Mentor, OH)  
Karpinski Engineering (Cleveland, OH)  
BioMotiv (Shaker Heights, OH)  
GeoPhy (New York City, NY)  
Thornton Tomasetti (New York City, NY)  
Texas Water Redevelopment Board (Austin, TX)  
FormLabs (Somerville, MA)  
Berkshire Brewing Company (South Deerfield, MA)  
L3 Open Water Power (Somerville, MA)  
Audible (Cambridge, MA)

- 2018: NNE (Durham, MA)  
Facebook (Menlo Park, CA)  
Pelican (South Deerfield, MA)  
Sanderson MacLeod (Palmer, MA)  
Ecolab (Saint Paul, MN)
- 2017: Simpson Gumpertz and Heger (Waltham, MA)  
United Technology Aerospace Systems (Windsor Locks, CT)  
Sterling Rope (Biddeford, ME)  
Partners HealthCare (Cambridge, MA)  
FloDesign Sonics (Wilbraham, MA)
- 2016: Instrumentation Laboratory (Bedford, MA)
- 2015: L3KEO (Northampton, MA)
- 2014: Glumac (San Francisco, CA)  
Heartflow (Redwood City, CA)  
Tesla (Fremont, CA)  
Schneider Electric (Foxboro, MA)  
Cirtec (East Longmeadow, MA)  
Boeing (Everett, WA)  
Hart Crowser (Seattle, WA)  
Microsoft (Redmond, WA)  
AMI/Stark Aerospace (Redmond, WA)  
Evoqua Water Technologies (Lowell, MA)  
Bolt (Boston, MA)  
TriPyramid (Westford, MA)  
Chrysler (Auburn Hills, MI)  
Leonard Rice (Denver, CO)  
KL&A (Golden, CO)  
Covidien (Boulder, CO)  
IDEO (Cambridge, MA)  
GE Global Research (Niskayuna, NY)  
Sikorsky (Stratford, CT)
- 2013: Covidien (North Haven, CT)
- 2011: Fuss & O'Neill (Manchester, CT)  
Tighe & Bond (Westfield, MA)