

# Deborah E. Dickerson, PhD CIH CSP CHMM

Associate Professor  
Human Factors and Safety Engineering  
Industrial and Systems Engineering  
Virginia Tech  
544 Whittemore Hall, Blacksburg, VA 24061  
540-449-2068  
debickerson@vt.edu

## Education

**Doctor of Philosophy (2007)**

Virginia Tech, Industrial and Systems Engineering (Safety Engineering)

**Master of Science (2006)**

Virginia Tech, Industrial and Systems Engineering (Safety Engineering)

**Master of Science (1999)**

North Carolina State University, Biological Sciences

**Bachelor of Science (1996)**

Virginia Tech, Biological Sciences

## Certifications

**Certified Industrial Hygienist (CIH) 2001 - present**

Comprehensive Practice 8234CP; American Board of Industrial Hygiene

**Certified Safety Professional (CSP) 2003 - present**

Comprehensive Practice 17546; Board of Certified Safety Professionals

**Certified Hazardous Materials Manager (CHMM) 2003 - present**

Master Level 12240; The Institute of Hazardous Materials Management

**Asbestos Management Planner 1996 – 2006**

Virginia Department of Professional and Occupational Regulation, 18VAC15-20

## Research Interests

Control of hazardous materials and risks in work, system, and product design

## Expertise Summary

Over 25 years of professional and academic experience in product safety, system safety, industrial hygiene, hazardous materials management, and hazard control.

**Expertise in:** product design and safety; design of product warnings and labels; chemical exposure risks, analysis, and health outcomes; industrial system design, safety, and training.

## Experience

### **Associate Professor (June 2015 – present)**

Virginia Tech, Grado Department of Industrial and Systems Engineering  
Developing research, scholarship, and educational programs emphasizing control of hazards in systems and products.

### **Director (July 2018 – present)**

Product and System Safety Laboratory, Virginia Tech  
Leading research on safe design of products, systems, and warnings.

### **President (June 2014 – present)**

Dickerson Consulting LLC  
Providing consultation, design, training, and expert witness services in the areas of product and system safety, industrial hygiene, occupational safety, accident prevention. Expert witness services for plaintiff and defense in industrial accident, chemical release, and product design cases in federal and state jurisdictions.

### **Assistant Professor (August 2007 – June 2015)**

Virginia Tech, Via Department of Civil and Environmental Engineering  
Developed research, scholarship and educational programs emphasizing control of hazards arising from the built environment and inherent to construction processes.

### **Director (1996-2006)**

Environmental, Health & Safety Services, Virginia Tech  
Led operation, including staff of 26 and combined budgets of 3.4 million. Responsible for environmental and occupational compliance services for the more than 10,000 employees of this major land-grant university. Managed the following programs: chemical hygiene and laboratory safety, hazardous chemical waste management, asbestos and lead management, chemical health hazards, industrial ventilation, non-ionizing radiation, laboratory safety, infection control, hearing conservation, pulmonary function testing, respiratory protection, asbestos and lead, and medical surveillance. Managed annual operating budget of 1.1 million.

### **Adjunct Instructor (1999–2006)**

Industrial & Systems Engineering, Virginia Tech  
Developed new curricula and taught coursework in industrial hygiene and occupational safety. Served as faculty advisor for student section of American Society of Safety Engineers.

## Teaching and Advising

### Courses Taught

Product Safety: Design, Warnings, Liability	2023 – present
System Safety Analysis	2022 – present
Principles of Industrial Hygiene	1999 – present
Risk and Hazard Control	2019 – present
Introduction to Human Factors Engineering	2019 – 2022
Occupational Safety	2000 - 2006
Prevention through Design	2008 - 2014
Building Technology System Design	2008 - 2010
Indoor Environmental Quality and Sustainable Facilities	2009 - 2011
Construction Health and Safety	2017 - 2018

## Research Activities

### Sponsored Research and Other Grants

(Total: \$13,904,208)

**Project Title:** Center for Innovation in Construction Safety and Health

**Sponsor:** National Institute for Occupational Safety and Health (NIOSH)

**Funding Amount:** \$9,887,239

**Beginning/Ending Dates:** 08/30/09 – 08/29/14

**Role:** Co-PI

**Description:** Establish research center at Virginia Tech

**Project Title:** (T03) Safety and Ergonomics Training

**Sponsor:** National Institute for Occupational Safety and Health (NIOSH)

**Funding Amount:** \$1,395,106

**Beginning/Ending Dates:** 07/01/16 - 06/30/21

**Role:** Co-PI

**Description:** Training grant (T3) provides graduate education to students interested in studying occupational safety and health and safety engineering

**Project Title:** Health Hazard Controls: Evidence-based intervention strategy

**Sponsor:** National Institute for Occupational Safety and Health (NIOSH)

**Funding Amount:** \$980,460

**Beginning/Ending Dates:** 11/01/19 – 10/31/24

**Role:** PI

**Description:** Design solutions to control health hazards

**Project Title:** Interdisciplinary Team in Pervasive Computing Design

**Sponsor:** Office of Vice President for Research at Virginia Tech

**Funding Amount:** \$200,000

**Beginning/Ending Dates:** 08/2007-05/2009

**Role:** co-PI

**Project Title:** Bio-Inspired Buildings: Integrating Building and Biological Systems Theories to Transform the Built Environment

**Sponsor:** Dean of the Graduate School, Virginia Tech

**Funding Amount:** \$900,000

**Beginning/Ending Dates:** 8/13-8/16

**Role:** co-PI

**Description:** Creation of a multidisciplinary doctoral program in bio-inspired building and infrastructure design

**Project Title:** Sustainable Healthy Schools

**Sponsor:** National Science Foundation

**Funding Amount:** \$174,275

**Beginning/Ending Dates:** 08/09-08/12

**Role:** Principal Investigator

**Description:** Systems engineering management of school hazards

**Project Title:** (R01) Dust-control: Strategic Technology Intervention

**Sponsor:** National Institute for Occupational Safety and Health

**Funding Amount:** \$580,275

**Beginning/Ending Dates:** 08/09-08/13

**Role:** Principal Investigator

**Description:** Theory-based behavioral and attitudinal interventions to produce changes in stakeholder willingness to adopt safety innovations.

**Project Title:** (R01) Prevention through Design (PtD) Adoption Readiness

**Sponsor:** National Institute for Occupational Safety and Health (NIOSH)

**Funding Amount:** \$251,071

**Beginning/Ending Dates:** 08/15/12-08/14/14

**Role:** PI

**Description:** Survey research on safety innovation perceptions

**Project Title:** Pervasive Computing Innovations

**Sponsor:** Institute for Critical Technology and Applied Science (ICTAS)

**Funding Amount:** \$10,000

**Beginning/Ending Dates:** 2007-2008

**Role:** PI

**Description:** Design prototype for a wearable sensor to detect carbon monoxide

**Project Title:** Current Trends and Stakeholder Perceptions of Radon-resistant Home Construction

**Sponsor:** Institute for Culture, Society, and the Environment

**Funding Amount:** \$19,500

**Beginning/Ending Dates:** 5/16-8/16

**Role:** PI

**Description:** Current trends in Radon Resistant Construction in the U.S. homebuilding market

**Project Title:** Positioning MLSoC to Discover Lifecycle Value in the Dynamic Construction Industry

**Sponsor:** Research Affiliates Myers-Lawson School of Construction

**Funding Amount:** \$75,000

**Beginning/Ending Dates:** 07/12-07/13

**Role:** Co-PI

**Description:** Funding to plan for the BioBuild Program

**Project Title:** Prevention through Design in Masonry

**Sponsor:** Center for Innovation in Construction Safety and Health

**Funding Amount:** \$5,000

**Beginning/Ending Dates:** 1/2011-7/2011

**Role:** PI

**Description:** Pilot project grant to perform study of ventilated saw design

**Project Title:** Occupational Respiratory Hazards

**Sponsor:** Institute for Critical Technology and Applied Science (ICTAS)

**Funding Amount:** \$10,000

**Beginning/Ending Dates:** 1/2009-6/2009

**Role:** PI

**Description:** Pilot project on silica exposures and equipment design

**Project Title:** Graduate Student Tuition Support

**Sponsor:** DARPA

**Funding Amount:** \$7,500

**Beginning/Ending Dates:** 1/2008-12/2008

**Role:** PI

**Description:** Participation in design competition

**Project Title:** Building-related Environmental Assessment and Technology in Housing, Existing (BREATHE)

**Sponsor:** Institute for Culture, Society, and the Environment

**Funding Amount:** \$18,000

**Beginning/Ending Dates:** 5/2008-8-2008

**Role:** PI

**Description:** Pilot study of indoor environmental quality in homes

**Project Title:** Respiratory Hazard Monitoring

**Sponsor:** Institute for Critical Technology and Applied Science (ICTAS)

**Funding Amount:** \$19,500

**Beginning/Ending Dates:** 2007-2008

**Role:** PI

**Description:** Design for a ventilated sanding tool.

## Publications

### Book chapter

1. Young-Corbett, DE. (2013). Prevention through Design: Eliminating Occupational and Environmental Risk through Design of Equipment, Work, and Systems. *Chapter in: The Handbook of Industrial and Systems Engineering*, 2nd Edition. Taylor and Francis, CRC Press. Boca Raton, FL. Badiru, AB, editor.

### Papers in refereed journals

1. Young-Corbett, D.E. and Nussbaum, M.A. (2009a). Dust Control Technology Usage Patterns in the Drywall Finishing Industry. *Journal of Occupation and Environmental Hygiene*. 6(6): 315-323.
2. Young-Corbett, D.E. and Nussbaum, M.A. (2009b). Dust Control Effectiveness of Drywall Sanding Tools. *Journal of Occupational and Environmental Hygiene*. 6(7): 385-389. (2009 Impact Factor: 1.180)
3. Young-Corbett, D.E., Nussbaum M.A. and Winchester, W.W. (2010). Usability evaluation and redesign specifications for drywall sanding tools. *International Journal of Industrial Ergonomics*. 40(1): 112-118.
4. Forsyth, J.B.\*, Martin, T.L., Young-Corbett, D.E., Dorsa, E. (2012). Feasibility of Intelligent Monitoring of Construction Workers for Carbon Monoxide Poisoning. *Journal of IEEE Transactions on Automation Science and Engineering*. 9(3): 505-515.
5. Bhattacharjee, S., Ghosh, S\*., Young-Corbett, D., Fiori, C. (2013). Comparison of Industry Expectations and Student Perceptions of Knowledge and Skills Required for Construction Career Success. *International Journal of Construction Education and Research* 9(1):19-38.
6. Popov, G, Blunt, LA, McGlothlin, G, Young-Corbett, D, Zey, JN, Heckel, P, (2013). Integrating Prevention through Design in Undergraduate Curricula. *Professional Safety: Journal of the American Society of Safety Engineers* 44-49
7. Young-Corbett. (2014). Prevention through Design (PtD): Health Hazards in Asphalt Roofing. *Journal of Construction Engineering and Management*. 140(9): September 2014.
8. Weidman, J., Dickerson, D. E., & Koebel, C. T. (2015). Intervention to improve purchasing decision-maker perceptions of ventilated tools. *Journal of Construction Engineering and Management*, 141(6), 04015007.

9. Weidman, J., Dickerson, D. E., & Koebel, C. T. (2015). Prevention through design adoption readiness model (PtD ARM): An integrated conceptual model. *Work*, 52(4), 865-876.
10. Ghosh, S., & Dickerson, D. (2015). Modified interaction process analysis as a macroergonomic method of analyzing communication patterns in construction. *IIE Transactions on Occupational Ergonomics and Human Factors*, 3(1), 45-57.
11. Weidman, J., Dickerson, D., & Koebel, C. T. (2015). Prevention through Design: A Macroergonomic Conceptual Approach to Risk Reduction. *IIE Transactions on Occupational Ergonomics and Human Factors*, 3(1), 24-36.
12. Dickerson, D. E., & Ackerman, P. J. (2016). Risk-based maintenance management of US public school facilities. *Procedia Engineering*, 145, 685-692.
13. Weidman, J., Dickerson, D. E., & Koebel, C. T. (2016). Effective intervention strategy to improve worker readiness to adopt ventilated tools. *Journal of Construction Engineering and Management*, 142(8), 04016028.
14. Dickerson, D. E. (2016). Environmental relative burden index: a streamlined life cycle assessment method for facilities pollution prevention. *Journal of Green Building*, 11(1), 95-107.
15. Weidman, J. E., Dickerson, D. E., & Koebel, C. T. (2016). Technology Champions: A Theory-Based Intervention to Improve Adoption of Occupational Safety Innovations. *International Journal of Construction Education and Research*, 12(3), 193-207.
16. Kim, S., Nussbaum, M. A., Schoenfish, A. L., Barrett, S. M., Bolding, M. C., & Dickerson, D. E. (2017). Occupational Safety and Health Concerns in Logging: A Cross-Sectional Assessment in Virginia. *Forests*, 8(11), 440.
17. Ghosh, S., Dickerson, D. E., & Mills, T. (2019). Effect of the Last Planner System® on Social Interactions among Project Participants. *International Journal of Construction Education and Research*, 1-18.

### **Papers in refereed conference proceedings**

1. Sexton-Lewis, P. \*, Kleiner, B.M., and Young, D.E. (2004). User feedback on Moldex N-100 filtering face-piece design. Proceedings of the 48th Annual Meeting of the Human Factors and Ergonomics Society. (pp: 2013 – 2017) New Orleans, LA.
2. Young, D.E. and Kleiner, B.M. (2008). Drywall finishing industry: macro-ergonomic evaluation and intervention design. *Proceedings of the 9th edition of Human Factors in Organizational Design and Management (ODAM)*

International Symposium. L. Sznclwar, F. Marcia and U. Montedo (Editors); Sao Paulo, Brazil.

3. Young-Corbett, D.E. (2009). Building-related Environmental Assessment and Technology in Housing, Existing (BREATHE): development of standardized protocols for evaluating the indoor environmental quality of existing housing. *Proceedings of the 9th International Conference and Exhibition of Healthy Buildings 2009*. September 13-17. Syracuse, NY. USA.
4. Ghosh, S. \*, and Young-Corbett, D. (2009). Intersection between Lean Construction and Safety Research: A Review of Literature. *Proceedings of the 2009 Industrial Engineering Research Conference*, May 30 – June 3, Miami, FL.
5. Ghosh, S. \*, Young-Corbett, D., and Fiori, C. M. (2010). Emergent Themes of Instruments used to Measure Safety Climate in Construction. *Proceedings of the 2010 Construction Research Congress (CRC2010)*, May 8 – 11, Banff, Alberta.
6. Bhattacharjee, S., Ghosh, S. \*, and Young-Corbett, D. (2010). Energy Service Performance Contracting in Construction: A Review of the Literature. *Proceedings of the 46th ASC Annual International Conference*, held April 7- 10, Boston, MA.
7. Sexton-Lewis, P. \*, Young-Corbett, D.E., and Kleiner, B.M. (2010). Bioaerosol Exposures and Respiratory Symptoms Associated with Landscaping Mulch-handling Task. American Industrial Hygiene Conference and Exposition. May 22-27, Denver, CO, USA.
8. Bhattacharjee, S. \*, Ghosh, S. \*, and Young-Corbett, D. (2010). The Next Step to Improve Safety – Prevention through Design. *Proceedings of 2010 Associated Schools of Construction Region III Conference*. October 20-23, 2010. Downers,GA.
9. Young-Corbett, D and Ackerman, P.\* (2011). Condition Assessment Methodologies for Public School Indoor Environmental Health. *Proceedings of Indoor Air 2011: The 12th International Conference on Indoor Air Quality and Climate*. Austin, TX. June 5-10, 2011.
10. Young-Corbett, D. (2011). Sustainable Healthy Schools: A Lifecycle Analysis (LCA) Framework for Facility Condition Management. *Proceedings of the International Conference on Sustainable Design and Construction*. American Society of Civil Engineers. Kansas City, MO. March 23-25, 2011.
11. Bhattacharjee, S., Ghosh, S. \*, and Young-Corbett, D. (2011) The Next Step to Improve Safety – Prevention through Design. *47th Annual International Conference of Associated Schools of Construction*. April 6-9, 2011. Omaha, Nebraska, USA.



12. McNair, L., Young-Corbett, D. (2011). Building New Engineering Education Theory and Practice for Interdisciplinary Pervasive Computing Design. *Proceedings of the 2011 Annual Conference and Exposition of the American Society for Engineering Education*. Vancouver, BC, Canada. June 26 – 29, 2011.
13. Forsyth, J.B.\*, Martin, T.L., Young-Corbett, D., Dorsa, E. (2011) Feasibility Study of a Wearable Carbon Monoxide Warning System for Construction Workers. *9th Annual IEEE International Conference on Pervasive Computing and Communications (PerCom 2011)*. Seattle, WA. March 21-25, 2011.
14. Ghosh, S.\* , Bhattacharjee, S., and Young-Corbett, D. (2011). Identifying Critical Barriers Inhibiting Use of ESPC in the Private Building Sector. *47th Annual International Conference of Associated Schools of Construction*. April 6-9, 2011. Omaha, Nebraska, USA.
15. Bhattacharjee, S., Ghosh, S.\* , and Young-Corbett, D. (2011). Safety Improvement Approaches in Construction Industry: A Review and Future Directions. *Proceedings of the 47th Annual International Conference of Associated Schools of Construction*. April 6-9, 2011. Omaha, Nebraska, USA.
16. Ghosh, S.\* , Young-Corbett, D., and Van Aken, E. (2011). Role of Social Interaction in Construction Production Planning: A Conceptual Model. *Proceedings of the Institute of Industrial Engineers (IIE) Annual Conference and Expo 2011*. May 21 – May 25, 2011, in Reno, Nevada, USA.
17. Young-Corbett, D and Ackerman, P. (2011). Condition Assessment Methodologies for Public School Indoor Environmental Health. *Proceedings of Indoor Air 2011: The 12th International Conference on Indoor Air Quality and Climate*. Austin, TX. June 5-10, 2011.
18. Ghosh, S.\* , and Young-Corbett, D. (2011). Barriers to the Adoption of Prevention through Design (PtD) Controls among Masonry Workers. *International Council for Research and Innovation in Building and Construction Conference (CIB W099 Conference 2011)*, Washington, DC, USA, August, 2011.
19. Weidman, J.E.\* ,Young-Corbett, D., Koebel, C.T., Fiori, C., and Montague, E.N. (2011). Prevention through Design: Use of the Diffusion of Innovation Model to Predict Adoption. *International Council for Research and Innovation in Building and Construction Conference (CIB W099 Conference 2011)*, Washington, DC, USA. August, 2011.
20. Forsyth, J. B.\*; Martin, T. L.; Young-Corbett, D.; Dorsa, E. (2012); , "Feasibility of Intelligent Monitoring of Construction Workers for Carbon Monoxide Poisoning," *Automation Science and Engineering, IEEE Transactions on* , vol.9, no.3, pp.505-515, July 2012 doi: 10.1109/TASE.2012.2197390

21. Young-Corbett, D. (2012). Life Cycle Assessment (LCA) of Asbestos and Lead Building Materials in Schools: Goal and Scope Definition. *ICSDC 2011: Integrating Sustainability Practices in the Construction Industry*; Eds. Wai Kiong, Oswald Chong, and Christopher Hermreck; International Conference on Sustainable Design and Construction (ICSDC) 2011; Kansas City, Missouri, March 23-25, 2011.
22. Goldberg, A.\* and Young-Corbett, D. (2014). Decision making in commercial construction. *Human Factors in Organizational Design and Management XI: Nordic Ergonomics Society Annual Conference 46*. Broberg, O., Fallentin, N., Hasle, P., Jensen, P.L., Kabel, A., Larsen, M.E., Weller, T. (editors). Copenhagen, Denmark. August 17-20, 2014.
23. Goldberg, A.\* and Young-Corbett, D. (2014). Adoption Readiness of Prevention through Design (PtD) Controls in Concrete, Masonry, and Asphalt Roofing. *2014 Construction Research Congress*. Georgia Institute of Technology, Atlanta, GA, USA; May 19-21, 2014.
24. Dickerson, D. E., & Ackerman, P. J. (2016). Risk-based Maintenance Management of US Public School Facilities. In O. Chong, K. Parrish, P. Tang, D. Grau, & J. Chang (Eds.), *ICSDEC 2016 - INTEGRATING DATA SCIENCE, CONSTRUCTION AND SUSTAINABILITY* Vol. 145 (pp. 685-692). Arizona State Univ, Coll Avenue Commons, Tempe, AZ: ELSEVIER SCIENCE BV. doi:10.1016/j.proeng.2016.04.069
25. Dickerson, D.E. (2017). Current Trends and Stakeholder Perceptions of Radon-resistant Home Construction Engineering Sustainability 2017: Innovation and the Triple Bottom Line; Pittsburgh, PA. April 9-11.
26. Dickerson, D.E. (2017). Using the Environmental Relative Burden Index (ERBI) to Evaluate Pollution Prevention Options”Engineering Sustainability 2017: Innovation and the Triple Bottom Line; Pittsburgh, PA. April 9-11.
27. Dickerson, D.E. (2018). Total Worker Health® Approach to Improving Construction Worker Safety and Health. Institute of Industrial and Systems Engineers (IISE) Annual Conference and Expo 2018. Orlando, Florida. May 19-23, 2018.
28. Dickerson, D.E. (2018). Prevention through Design: Stakeholder Perceptions of PtD Solutions in Construction. Institute of Industrial and Systems Engineers (IISE) Annual Conference and Expo 2018. Orlando, Florida. May 19-23, 2018.

## Awards, Recognition, Invited Presentations

### 1. Best Paper Award

IEEE Transactions Best Paper of 2012:

Forsyth, J.B., Martin, T.L., Young-Corbett, D.E., Dorsa, E. (2012). Feasibility of Intelligent Monitoring of Construction Workers for Carbon Monoxide Poisoning. *Journal of IEEE Transactions on Automation Science and Engineering*. 9(3): 505-515. (2011 Impact factor: 1.46) From the reviewers: “The selection is a very nice paper with a creative and highly practical innovation to protect construction workers from CO poisoning with an in-helmet sensor. The authors motivate their design, report the implementation details, develop an elegant model to filter out motion and to model reliability, and then perform a convincing user study.”

### 2. Invited keynote presentations or lectures

- *National Conference on Prevention through Design*, National Institute for Occupational Safety and Health. August 23, 2011. Arlington, VA. Invited to speak on Prevention through Design in Engineering Education.
- *The Engineer of 2020 Workshop*, Purdue University. September 20, 2011. Invited to Speak on Prevention through Design.
- *Prevention through Design Workshop 2021*, Arizona State University. May 26-27, 2021. Keynote speaker on Prevention through Design for Health Hazards.

## Service Activities

- Instructor, Certified Product Safety Professional program, Society of Product Safety Professionals®, Arlington VA (2022-present)
- National Institute for Occupational Safety and Health, National Occupational Research Agenda (NORA) Construction Sector Council (2017-present)
- National Institute for Occupational Safety and Health, National Occupational Research Agenda (NORA); Healthy Work Design and Wellbeing Cross Sector Council (2018-present)
- National Institute for Occupational Safety and Health (NIOSH) advisory committee on Prevention through Design (2008-2015)
- Member: American Society of Safety Professionals, American Industrial Hygiene Association, Human Factors and Ergonomics Society