Malle R. Schilling

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EDUCATION

Ph.D. in Engineering Education from Virginia Polytechnic Institute and State University, Blacksburg, VA
Expected graduation Spring 2024
Dissertation Topic: Understanding Rurality in Engineering Education through Engagement and Engineering Career Pathways

M.S. in Systems Engineering from Virginia Polytechnic Institute and State University, Blacksburg, VA
Completed 2023
Specialization in Technical Leadership

B.S. in Mechanical Engineering from the University of Dayton, Dayton, OH
Completed 2018
Minor in Human Movement Biomechanics
Magna Cum Laude, University Honors with Distinction

FELLOWSHIPS, HONORS, AND AWARDS

Engagement Scholarship Consortium Emerging Engagement Scholar, 2023
National Science Foundation Graduate Research Fellow, 2021
New Horizon Graduate Scholar, 2019

GRANTS

Snapshots of Systems: Engaging Students in Place Through a Lens of Systems Thinking. **Schilling, M. R. (PI)**. $110 awarded from the 2021-22 John E. Dooley Student Engagement Grant (JEDSEG), awarded November 2021, not accepted due to constraints of COVID-19.

SEE VT Curriculum Project: Writing the Rural Food-Energy-Water Nexus. Rasheed, M. (PI), **Schilling, M. R. (co-PI)**, and Wright, H. (co-PI). $1,500 awarded from the Institute for Creativity, Arts, and Technology (ICAT) Student SEAD Grant at Virginia Tech, October 2020-2021.

PUBLISHED JOURNAL ARTICLES

Schilling, M. R. & Grohs, J. *A conceptual model for engineering educators in rural places: Critical reflection and engagement.* [*Manuscript accepted for publication* at *Studies in Engineering Education*].

Mathieson, D., Cotrupi, C., **Schilling, M. R.**, & Grohs, J. (2023). Resiliency through partnerships: Prioritizing STEM workforce pathways amid macro challenges. *School Science and Mathematics,* 1-13. https://doi.org/10.1111/ssm.12575.

Paradise, T., **Schilling, M. R.**, Grohs, J., & Laney, J. (2022). *Teacher experiences in a community-based rural partnership: Recognizing community assets. Journal of Pre-College Engineering Education Research, 12*(1), 39-59. https://doi.org/10.7771/2157-9288.1316.

Schilling, M. & Pinnell, M. (2019). The STEM gender gap: An evaluation of the efficacy of women in engineering camps. *Journal of STEM Education: Innovation and Research, 20*(1), 37-45.

JOURNAL ARTICLES IN PREPARATION

Schilling, M. R. & Grohs, J. *Reconciling modern engineering education with the everyday of rural schools and youth.* [Manuscript in review at the *Journal of Pre-College Engineering Education Research* Special Issue, *Provocations*].

Schilling, M. R., Matusovich, H.M., Grohs, J., Paradise, T., & Carrico, C. *Exploring middle school students' conceptions of engineering.* [Manuscript in preparation for submission to *Journal of Engineering Education*].

Grohs, J., Cotrupi, C., Mathieson, D., Norris, M., **Schilling, M. R.,** & Comer, C. *Assessing systems thinking in K-12 settings: A systematic mapping of existing K-12 tools.* [Manuscript in preparation for submission to *Frontiers in Education Special Issue*].

PUBLISHED GUEST EDITORIALS

Schilling, M., Vicente, S., Johnson, T., Jefferson, N., & Matusovich, H. (2023). *Considering leadership in engineering education: A call to action for research and practice*. *Journal of Engineering Education, 112(1),* 18-22.

PEER REVIEWED CONFERENCE PAPERS AND PRESENTATIONS

Schilling, M. R. & Grohs, J. *Developing a tool for the assessment of systems thinking in K-12 settings.* Paper accepted for presentation at the 2023 IEEE ASEE Frontiers in Education Conference, College Station, TX.

Schilling, M. R. & Grohs, J. (2023, June). *Engineering pathways for Appalachian Youth: Design Principles and Long-term Impacts of School-Industry Partnership.* Paper presented at the meeting of the American Society for Engineering Education, Baltimore, MD.

Schilling, M. R. & Grohs, J. (2022, June). *Benefits, roles and tensions: Understanding the process of collaboration in rural engineering education contexts.* Paper presented at the meeting of the American Society for Engineering Education, Minneapolis, MN.

Paradise, T. & **Schilling, M. R.** (2021, June). *Teacher Led Reflection Activity.* Paper presented at the meeting of the American Society for Engineering Education, Virtual Conference.

Schilling, M. R., Paradise, T., Grohs, J. R., Matusovich, H. M., Carrico, C., & Kirk, G. R. (2020, June). *Changes in Teacher Self-Efficacy Through Engagement in an Engineering Professional Development Partnership (RTP)*. Paper presented at the meeting of the American Society for Engineering Education, Virtual Conference.

Pinnell, M., Crosson, K., Altman, A., Hart, E., & **Schilling, M**. (2019, June). *Work in Progress: Can Faculty Assessment and Faculty Development be Accomplished with the Same Instrument?* Paper presented at the meeting of the American Society for Engineering Education, Tampa, FL.

Schilling, M. & Pinnell, M. (2019, April). *The Effectiveness of Engineering Camps as Pre-College Recruitment Tools*. Paper presented at the meeting of The Collaborative Network for Engineering and Computing Diversity (CoNECD), Crystal City, VA.

Schilling, M. & Pinnell, M. (2018, June). *The STEM gender gap: An evaluation of the efficacy of women in engineering camps*. Paper presented at the meeting of the American Society for Engineering Education, Salt Lake City, UT.

CONFERENCE PRESENTATIONS AND WORKSHOPS

Schilling, M. R., Grohs, J., and Kirk, G. (2021, September). *Research-informed Insights and Tools for Multi-stakeholder Collaborations.* Workshop presented at the 2021 Engagement Scholarship Consortium International Conference.

Schilling, M. R. (2021, September). *Engaging Appalachian Students in Culturally Relevant Engineering Activities.* Poster presented at the 2021 Engagement Scholarship Consortium International Conference.

Schilling, M. R., Grohs, J., and Laney, J. (2021, March). *Conceptualizing a Model of Rurality and Culturally Responsive, K-12 Engineering Education*. Workshop presented at the National Congress on Rural Education in Canada 2021.

Schilling, M. (2018, March). *The STEM gender gap: An evaluation of the efficacy of women in engineering camps*. Thesis presented at Honors Student Symposium at the University of Dayton, Dayton, OH.

Schilling, M. (2018, April). *The STEM gender gap: An evaluation of the efficacy of women in engineering camps*. Thesis presented at the Brother J.W. Stander Symposium at the University of Dayton, Dayton, OH.

BOOK CHAPTERS

Grohs, J., **Schilling, M. R.**, Laney, J., Kirk, G., & Matusovich, H. M. *(*2023). School-industry-university partnerships to support engineering pathways for rural youth. In S. L. Hartman & B. Klein (Eds.), *Middle of Somewhere: Rural education partnerships that promote innovation and change*. Harvard Education Press.

Grohs, J., Lesko, H., Brantley, J., **Schilling, M.**, Paradise, T., Carrico, C., Matusovich, H. M., & Kirk, G. (2020). Prioritizing relationships and supportive infrastructure in a university-school collaboration through and beyond COVID-19. In R. E. Ferdig, E. Baumgartner, R. Hartshorne, R. Kaplan-Rakowski, & C. Mouza (Eds.), *Teaching, technology, and teacher education during the COVID-19 pandemic: Stories from the field*. Association for the Advancement of Computing in Education (AACE).

INVITED SEMINARS AND PRESENTATIONS

Schilling, M. R. (2023, April 20). Recognizing rurality: Understanding the impact of place and space on K-12 engineering education. Presentation given at Purdue Engineering Education Seminar.

RESEARCH EXPERIENCE

Graduate Research Assistant, VT PEERS and PEERS Projects, 2019-present
Virginia Tech, Department of Engineering Education, Blacksburg, VA

- Lead data collection and analysis of qualitative and quantitative data, including interviews, focus groups, and surveys for conference papers and journal articles
- Collaborate with team members to develop data collection protocols and disseminate work
- Assist with the coding and assembly of Arduinos for middle school classroom activities
- Aid in writing and developing logic model for grant applications

Graduate Research Assistant, Roanoke City Public Schools STEM and Urban Planning Program, Summer 2023-present
Virginia Tech, Department of Urban Affairs and Planning, Blacksburg, VA

- Develop research protocol to collect evidence of systems thinking from middle school students
- Collaborate with university faculty and middle school teachers to develop and deliver place-based curriculum focused on urban heat islands and heat resilience
- Collect regular classroom observation data and conduct interviews with teacher stakeholders

Undergraduate Thesis Student, 2017-2018
University of Dayton, University Honors Program, Dayton, OH

- Created and designed original thesis project to explore diversity in engineering
- Worked with Diversity in Engineering Center (DEC) to evaluate the effects of engineering camps on participants' interest and self-efficacy in engineering
- Received funding from the Summer Undergraduate Research Experience Program and KEEN to complete research
- Disseminated surveys at 4 summer engineering camps during the Summer of 2017 and 2018
- Analyzed survey responses and compiled reports to share results with DEC staff

Summer Undergraduate Research Experience Fellow, 2017 and 2018
University of Dayton, School of Engineering, Dayton, OH

- Conducted research for Honors Thesis
- Collaborated with the Diversity in Engineering Center to design and disseminate a survey to explore the recruitment of engineering camp participants to the University of Dayton
- Coordinated service project with the East End Community Center's Miracle Makers Program where all fellows led engineering outreach activities with students in 2nd to 6th grade
- Worked with STEM professors and teachers to develop engineering activities for after school programming to increase STEM and reading literacy for 3rd graders

Undergraduate Research Assistant, Fall 2017
University of Dayton, School of Engineering, Office of the Dean, Dayton, OH

- Researched promotion and tenure policies at universities across to establish context for the lack of diversity in engineering faculty and best practices for promotion and tenure
- Compiled sources and notes for the completion of a literature review to be shared internally in the School of Engineering to influence the update of promotion and tenure policies
- Worked with faculty team to develop conference presentations

TEACHING EXPERIENCE

Graduate Teaching Assistant, ENGE 5604: Engineering Education Research Methods, Fall 2023
Virginia Tech, Department of Engineering Education, Blacksburg, VA

- Facilitate class discussion based on readings related to researcher positionality, research ethics, qualitative methods, and quantitative methods
- Provide regular feedback to students on course assignments
- Aid in the delivery of course content to scaffold research methods for first-year engineering education graduate students

Faculty Apprentice, ENGE 6714: Research-Practice Partnerships to Address Wicked Problems in Educational Systems, Spring 2023
Virginia Tech, Department of Engineering Education, Blacksburg, VA

- Collaborated with faculty member to determine readings as they relate to course outcomes and ongoing class discussions
- Led activities to synthesize readings and discussion points pertaining to research-practice partnerships in educational contexts and emergent strategy
- Provided formative feedback on group project work

Curriculum Writer, Summer Enrichment Experience at Virginia Tech (SEE VT), 2020-2022
Virginia Tech, School of Education, Blacksburg, VA

- Collaborated with an interdisciplinary team of graduate students and professors from the VT School of Education and the College of Agriculture and Life Sciences to develop STEM curriculum for summer camp for middle school students from Appalachian communities in Virginia
- Used principles of the food-energy-water (FEW) nexus as defined by the United Nations, the engineering design process, systems thinking, and critical pedagogies of place to develop curriculum
- Developed teaching case studies by interviewing regional businesses and community members about connections to FEW nexus and workforce

Instructor, Systems Thinking Elective Course, Summer 2022
Virginia Governor's School for Agriculture, Blacksburg, VA

- Utilized principles of backwards design to develop curriculum to introduce high school students to principles of systems thinking, tools to visualize systems, and ways to address systems problems
- Led 20 students through exercises to engage them in real-world problems and contexts
- Engaged students in reflections on place, systems, and multi-solving

Graduate Teaching Assistant, Rising Sophomore Abroad Program, Spring 2020 and 2022
Virginia Tech, Department of Engineering Education, Blacksburg, VA

- Co-led weekly recitation sessions with about 30 undergraduate engineering students per track to prepare to travel to South Korea and Taiwan (2020) and the UK and Ireland (2022)
- Facilitated lessons about the culture, history, and language of destination countries
- Worked with RSAP team to lead lessons and communicate information with students

Guest Lecturer, ALCE 4244: Teaching and Training Methods in Agriculture and Life Sciences, Spring 2022
Virginia Tech, Department of Agriculture, Leadership and Community Education, Blacksburg, VA

- Developed activity around critical pedagogy of place and systems thinking in connection with the FEW Nexus
- Encouraged students to engage with thinking about how place, systems thinking, and critical consciousness can be transferred to their semester project and future teaching strategies

Guest Lecturer, ENGE 1034: First Year Hypatia Seminar, Fall 2021
Virginia Tech, Center for the Enhancement of Engineering Diversity, Blacksburg, VA

- Developed reflective activity for students around systems thinking and critical pedagogy of place
- Encouraged students to engage with system mapping and identifying the impact of engineering in different contexts

Guest Lecturer, ENGE 1215: Foundations of Engineering, 2020-2021
Virginia Tech, Department of Engineering Education, Blacksburg, VA

- Developed materials to introduce students to engineering ethics
- Encouraged students to engage in perspective-taking and decision-making in the context of case studies

LEADERSHIP EXPERIENCE

Small Group Coordinator, New Horizon Graduate Scholars, 2020-2022
Virginia Tech, College of Engineering, Blacksburg, VA

- Coordinate four small groups for 50 graduate student peers including: Introduction to Disciplinary Reading and Writing Group, Improving Writing Group, Thesis and Dissertation Groups, and Productivity Groups
- Communicate with supervisor and assistant coordinator
- Share information and promote groups with fellow NHGS
- Create and improve strategies for reading and writing utilizing research and resources about graduate student experiences

Small Group Leader, New Horizon Graduate Scholars, 2020-2022
Virginia Tech, College of Engineering, Blacksburg, VA

- Coordinated and communicated reading and writing strategies with about 6 graduate student peers
- Record feedback from group members to improve group structure and strategies
- Created space for community among graduate student peers

PROFESSIONAL EXPERIENCE

Engineering Camp Coordinator, Jan-July 2019
University of Dayton, Diversity in Engineering Center, Dayton, OH

- Monitored camp applications and registrations and communicated with applicants and families
- Interviewed and hired undergraduate students for camp leader positions
- Communicated with industry and individual camp sponsors to solicit donations
- Coordinated faculty and staff members involved with camp trainings, activities, and modules

Project Engineering Co-Op, 2016-2017
Allied Motion, Dayton, OH

- Assisted lab technicians and project engineers to test motors for military and aerospace applications
- Designed experimental set-ups to collect test data and compile reports for manufacturing plant
- Reviewed and recommended changes to designs to solve manufacturing problems and optimize product performance
- Communicated with purchasing department and model shop to acquire parts required for prototype assembly and testing

PROFESSIONAL AND COMMUNITY SERVICE

Committee Service

- Faculty Search and Hiring Committee, Virginia Tech Dept. of Engineering Education, AY 2021-22
- Equity and Inclusion Committee, Virginia Tech Dept. of Engineering Education, AY 2021-23

Journal and Conference Reviewer

- Journal of Pre-College Engineering Education Research
- Journal of Women and Minorities in Science and Engineering
- American Society for Engineering Education
- Collaborative Network for Engineering and Computing Diversity
- Frontiers in Education

Conference Attendance

- 2023 Engagement Scholarship Consortium
- 2023 Rural Student Success unConference
- 2018, 2020, 2021, 2022, 2023 ASEE Conferences
- 2021 Engagement Scholarship Consortium
- 2021 Rural College Access and Success Summit
- 2021 National Congress on Rural Education in Canada
- 2019 CoNECD Conference, Crystal City, VA

Professional Membership

- American Society for Engineering Education
- Tau Beta Pi

Virginia Tech Student Transition Engineering Program (STEP) Academic Coach, Summer 2021, 2022
Virginia Future Farmers of America (FFA) Agriscience Fair Judge, Summer 2022