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EDUCATION

- Ph.D., Engineering Education, Virginia Tech, Blacksburg, VA, 2017
Project Title: Into the Workplace: Exploring the Learning Experiences of Newcomer Engineers during the School-to-Work Transition
- Certificate in Cognition and Education, Virginia Tech, Blacksburg, VA, 2016
- M. Eng., Mechanical Engineering, Virginia Tech, Blacksburg, VA, 2016
Project Title: Exploring Student Perceptions of Capstone Learning Outcomes
- B. S., Aerospace Engineering, Virginia Tech, Blacksburg, VA, 2011

JOURNAL PUBLICATIONS

- Lutz, B.**, Perova-Mello, N., Brown, S. (2019) Exploring Practicing Engineers' Understanding of Fluid Mechanics Concepts. *The International Journal of Engineering Education*, 35(2), 535-547.
- Brown, S. A., **Lutz, B.**, Ha, O., Perova-Mello, N. (2019) Exploring Differences in Statics Concept Inventory Scores for Students and Practitioners. *The Journal of Engineering Education*, 108(1), 119-135.
- Barlow, A., Brown, S. A., **Lutz, B.**, Pitterson, N., Adesope, O., Hunsu, N. (2019, in revision) Development of an Instrument to Measure Student In-Class Cognitive Engagement. Article in revision for *The Journal of Engineering Education*
- Barlow, A., **Lutz, B.**, Perova-Mello, N., Fisher, K.Q., & Brown, S. A. (2018) Factors of Sensemaking Affecting Engineering Faculty's Decision to Use the In-Class Cognitive Engagement Survey. *The International Journal of Engineering Education*, 35(5), 1658-1670
- Barner, M. S., Brown, S. A., **Lutz, B.**, Montfort, D. (2018) Engineering Faculty Interpretations of Pull-Oriented Develop and Why Context Matters. *The International Journal of Engineering Education*, 35(5), 1644-1657.
- Brown, S. A., Montfort, D., Perova-Mello, N., **Lutz, B.**, Berger, A., & Streveler, R. (2018) Framework Theory of Conceptual Change to Interpret Undergraduate Engineering Students' Explanations about Mechanics of Materials Concepts. *The Journal of Engineering Education*, 107(1), 113-139.
- Lee, W. C., **Lutz, B.**, Hermundstad A. (2017) Learning from Practitioners that Support Underrepresented Students in Engineering. *The Journal of Professional Issues in Engineering Education and Practice*, 144(2), 04017016.
- Lutz, B.** and Paretto, M.C. (2017) Exploring Students' Perspectives on Capstone Learning Outcomes. *The International Journal of Engineering Education*, 33(5), 1521-1533.

Lutz, B., Hixson, C., Paretto, M. C., Epstein, A., & Lesko, J. (2015) Mentoring and facilitation in entrepreneurship education: Beliefs and practices. *The Journal of Engineering Entrepreneurship*, 6(1), 37-51.

PEER-REVIEWED CONFERENCE PAPERS

Lutz, B. and Paretto, M. C. (2019) *Development and Implementation of a Reflective Journaling Method for Qualitative Research*. Paper presented at the American Society for Engineering Education, Tampa, FL.

Lutz, B. and Canney, N., Brunhaver, S. (2019) *I wish I could do more: A qualitative meta-analysis of Early Career Engineers' Perceptions of Agency in their Workplaces*. Paper presented at the American Society for Engineering Education, Tampa, FL.

Chang, K., **Lutz, B.**, Brown, S. (2019) *Workforce Development Needs and Objectives of Today's Transportation Engineering Professional*. Paper presented at the American Society for Engineering Education, Tampa, FL

Lutz, B., Bothwell, M., Mallette, N., AuYeung, N., Carlisle, T., Davis, S. (2019) Practitioner Learning Community: Design of Instructional Content, Pedagogy, and Assessment Metrics for Productive, Inclusive, and Socially-Just Teaming Practices. Paper presented at the annual ASEE Collaborative Network for Engineering and Computing Diversity Conference, Washington DC.

Lutz, B., Ironside, A., Brown, S. (2018) *Exploring Faculty Beliefs about Teaching Evaluation Practices: What is Missing from Current Measures?* Paper presented at the American Society for Engineering Education, Salt Lake City, UT.

Lutz, B., Brown, S., Adesope, O., Simmons, D. Hunsu, N, Ironside, A., Groen, C. (2018) Measuring Engineering Students' Engagement In-class Cognitive Engagement: Survey Development informed by Contemporary Educational Theories. Paper presented at the American Society for Engineering Education, Salt Lake City, UT.

Koretsky, M., Cao, Y., **Lutz, B.** (2018) *Cultivating the Next Generation: Outcomes from a Learning Assistant Program in Engineering*. Paper presented at the American Society for Engineering Education, Salt Lake City, UT.

Taylor, A., Lee, W. C., **Lutz, B.** (2018) *A Failed Attempt to Develop a Measure of Students' Subjective Task Value for Diversity Education*. Paper presented at the American Society for Engineering Education, Salt Lake City, UT.

Barlow, A. **Lutz, B.**, Brown, S. (2018) *Student Perspectives on Cognitive Engagement: Preliminary Analysis from the Course Social and Cognitive Engagement Surveys*. Paper presented at the American Society for Engineering Education, Salt Lake City, UT.

Gestson, S., **Lutz, B.**, Brown, S. (2018) *The Role of Contextual Representations in Engineering Practitioner Problem Solving*. Paper presented the American Society for Engineering Education, Salt Lake City, UT.

Boyd-Sinkler, K., Hermunstad, A., Artiles, M., Phillips, C. M., **Lutz, B.**, Lee, W. C. (2018) *Student Conceptualizations about Diversity: "How would You Describe the Diversity in Engineering at Your Institution?"* Paper presented at the ASEE Collaborative Network for Engineering and Computing Diversity Conference, Washington DC.

Taylor, A., Waters, R., Bhaduri, S., **Lutz, B.**, Lee, W. C. (2017) *Student Attitudes about Diversity: If the field of engineering were more diverse, what would that mean for you?* Paper to be presented at the IEEE Frontiers in Education conference, Indianapolis, IN.

Paretti, M. C., & Kotys-Schwartz, D. A., & Howe, S., & Ford, J. D., & **Lutz, B.**, & Kochersberger, K., & Gewirtz, C., & Rosenbauer, L. M., & Arunkumar, S. (2017), *Collaborative Research: From School to Work: Understanding the Transition from Capstone Design to Industry*. Paper presented at the American Society for Engineering Education Annual Conference, Columbus, OH.

Hampton, C. Williams, S., Hermundstad, A., Mitchell, A., Taylor, A., Boyd-Sinkler, K., Artiles-Fonseca, M., Waters, R., Lee, Walter C., **Lutz, B.** (2017) *Action on Diversity: A Content Analysis of ASEE Conference Papers, 2015-2016*. Paper presented at the American Society for Engineering Education Annual Conference, Columbus, OH.

***Lutz, B.** and Paretti, Marie C. (2017) *Exploring School-to-Work Transitions through Reflective Journaling*. Paper presented at the American Society for Engineering Education Annual Conference, Columbus, OH.

Taylor, A. and **Lutz, B.**, Hampton, C., Watford, B., Lee, W. C. (2017) *Critical Pedagogies and First-year Engineering Students' Conceptions of 'What it means to be an Engineer'*. Paper presented at the American Society for Engineering Education Annual Conference, Columbus, OH.

Williams, S., **Lutz, B.**, Hampton, C., Matusovich, H., Lee, W. C. (2016) *Exploring Student Motivation towards Diversity Education in Engineering*. Paper presented at the IEEE Frontiers in Education Annual Conference, Erie, PA.

Amelink, C., **Lutz, B.**, Karugarama, M., Lesko, J. (2016) *Graduate Summer Bridge Program: Building Community and Preparedness among Engineering Graduate Students*. Paper presented at the American Society for Engineering Education Annual Conference, New Orleans, LA.

Goldberg, S., Rich, J., Masnick, A., Paretti, M. C., Groen, C., **Lutz, B.**, McNair, L. (2016) *Examining Students' Metacognitive Awareness through Analysis of Student-Generated Learning Responses*. Paper presented at the American Society for Engineering Education Annual Conference, New Orleans, LA.

Lee, Walter C., **Lutz, B.** (2016) *An Anchored Open-Ended Survey Approach in Multiple Case Study Analysis*. Paper presented at the American Society for Engineering Education Annual Conference, New Orleans, LA.

Lutz, B. and Paretti, Marie C. (2016) *Student Perceptions of Capstone Learning Outcomes*. Paper presented at the semi-annual conference on Capstone Design Education 2016, Columbus, OH.

Lutz, B. and Paretti, M. C. (2015), *Student Perspectives on Capstone Design Learning*. Paper presented at the American Society of Engineering Education Annual Conference, Seattle, WA.

Brozina, S., Smith, C., **Lutz, B.**, Nicewonder, S. (2014) *Is a Mac "PC" in Engineering?* Paper presented at the IEEE FIE Annual Conference, Madrid, Spain.

* Paper was the recipient of the Best Conference Paper at the 2017 ASEE annual conference.

Lutz, B. and Paretti, M. C. (2014) *Student Perceptions of Project Mentoring: What Behaviors and Practices Matter?* Paper presented at the American Society for Engineering Education Annual Conference, Indianapolis, IN.

Lutz, Ben, Hixson, Cory, Paretti, Marie C., Epstein, Alex, & Lesko, John J. (2014) *Mentoring and Facilitation in Entrepreneurship Education: Beliefs and Practices.* Paper presented at the NCIIA (Now VentureWell) Open 2014 Conference, San Jose, CA.

Paretti, M. C., Pembridge, J., Brozina, S., **Lutz, B.**, Phanthanousy, J. (2013) *Mentoring Team Conflicts in Capstone Design: Problems and Solutions.* Paper presented at the American Society for Engineering Education Annual Conference, Atlanta, GA.

CURRENT AND PENDING AWARDS

California Education Learning Lab. “The Mechanics of Inclusion and Inclusivity in Mechanics.” Amount awarded: \$1,300,000. PIs: Brian Self, Dominic Dal Bello, Danielle Harlow. Co-PIs: **Benjamin D. Lutz**, Robert Jorstad, Brian Youngblood, Andrew Maul, Geraldine Cochran, Laura Rios, Peter Schwartz. Submitted 3/15/19. Status: Awarded 4/22/19

Engineering Information Foundation. “Exploring the Role of Gender Composition on Engineering Teams’ Ideation and Creative Capacity.” Amount awarded: \$19,606. PI: **Benjamin D. Lutz**. Submitted 2/28/19. Status: Awarded 4/16/19

National Science Foundation No.: 1830836. “Research Initiation: Reimagining Engineering Societies and Organizations to Support Participation of Women and Underrepresented Minority Students.” Amount awarded: \$200,000. Division: EEC-RIEF. PI: Harriet B. Nembhard. Co-PIs: **Benjamin D. Lutz**; Shane A. Brown. Submitted: 2/22/2018. Status: Awarded 9/4/2018

MANUSCRIPTS IN PREPARATION AND UNDER REVIEW

Lutz, B. and Paretti, M. C. (2019, in preparation) Into the Workplace: Exploring School-to-Work Transitions through Reflective Journaling. Manuscript in preparation for *The International Journal of Engineering Education*.

Lee, W. C., **Lutz, B.** (2019, in preparation) Incorporating Diversity in the Engineering Curriculum: A Qualitative Investigation of Student Motivation. Manuscript in preparation for *The Journal of Women and Minorities in Science and Engineering*.

Lutz, B. and Paretti, M. C. (2019, under review) Unpacking the Content of Learning Experiences of Recent Engineering Graduates during the School-to-Work Transition. Manuscript in Preparation for *Engineering Studies*

Lutz, B., Paretti, M.C. (2019, in preparation) Exploring the Learning Trajectories of Recent Engineering Graduates during the School-to-Work Transition. Manuscript in preparation for *Engineering Studies*.

Lutz, B., Brown, S.A. (2019, in preparation) Exploring Engineering Faculty Beliefs about Instructional Evaluation: Barriers and Opportunities. Manuscript in preparation for *The Journal of Engineering Education*.

INSTRUCTIONAL AND RELEVANT WORK EXPERIENCE

2018 – Present, Assistant Professor of Design, Mechanical Engineering, California Polytechnic State University San Luis Obispo

- Courses taught: ME 211 (Statics) and ME 128 (Introduction to Mechanical Engineering), ME 234 (Philosophy of Design), ME 328 (Machine Design I), ME 229 (Introduction to Mechanical Engineering for Transfer Students)
- Member of Mechanical Engineering Diversity and Inclusion committee
- Member of Dean’s College of Engineering Diversity and Inclusion committee

2017 – 2018, Practitioner Learning Community member, College of Engineering Change Team, Oregon State University

- Develop learning modules and assessment tools for inclusive and socially just teaming practices.
- Working with faculty to adapt and customize content for contextually-relevant pedagogy.

2014 – 2016, Lead Instructor for STEP summer bridge program, Center for the Enhancement of Engineering Diversity (CEED), Virginia Tech

- Infusion of conceptual design processes and problem-based learning pedagogies.

2014 – 2016, Undergraduate Teaching Assistant (UTA) Coordinator, Engineering Education, Virginia Tech

- Led development of Undergraduate TA program at Virginia Tech.

2015, Instructional Development Team: Graduate Student Summer Bridge Program, College of Engineering Dean’s Office, Virginia Tech

- Development and assessment of summer bridge program for underrepresented students in engineering.

2015, Instructor: ENGE 1216: Engineering Explorations, Engineering Education, Virginia Tech

- Lead instructor for one section of an engineering fundamentals course

2013, Mentor: Summer Engineering Education Collaboratory for Undergraduate Research, Virginia Tech

2012, Instructor: ENGE 1024: Engineering Explorations, Engineering Education, Virginia Tech

- Workshop leader for three sections of engineering fundamentals

2011 – 2012, Team mentor: FTC Robotics league, Richlands High School, Richlands, VA

2011 – 2102, Undergraduate Teaching Assistant: Introduction to Astronomy, Physics Dept., Virginia Tech

2009 – 2010, Tutor: Student Athlete Academic Support Services, Virginia Tech

PRESENTATIONS AND INVITED TALKS

Lutz, B. & Paretto, M.C., (2018) *Exploring School-to-Work Transitions through Reflective Journaling*. Invited talk at the 2018 American Society of Engineering Education annual conference best-paper plenary.

Watford, B.A., Taylor, A.R., **Lutz, B.**, Hampton, C., Lee, W.C. (2017) *Critical Pedagogies and First-Year Engineering Students' Conceptions of 'What it means to be an Engineer'*. Paper presented at the 65th Annual Conference of the Japanese Society for Engineering Education, Tokyo City, Japan.

Lutz, B. and Paretto, Marie C. (2016) *Student Perspectives of Capstone Learning Outcomes*. Poster presented at semi-annual Capstone Design Conference, Columbus, OH.

Lutz, B. and Paretto, Marie. C. (2016) *Into the Workplace: Exploring Student Learning in the School-to-Work Transition*. Presented at the Annual Conference on College Communication and Composition, Houston, TX.

Lutz, B. An Introduction to Qualitative Methodologies (2015) Presented as a guest lecture in an undergraduate research methods course (ALCE 4994), Blacksburg, VA.

Lutz, B. (2015) *How do Recent Engineering Graduates Become Current Engineering Professionals?* Invited talk at the ASEE Student Division Collaboratory Research Symposium, Blacksburg, VA.

Epstein, A., **Lutz, B.**, Paretto, Marie C. (2013) *Facilitation Practices in Project-based Learning*. Poster presented at Summer Engineering Education Collaboratory for Undergraduate Research Symposium, Blacksburg, VA.

RESEARCH EXPERIENCE

2018 – Current, CREATE Research Group Leader, Cal Poly San Luis Obispo

CREATE stands for Critical Research in Engineering And Technology Education. CREATE is run by myself and various undergraduate research assistants where we explore issues of diversity, equity, and inclusion in areas of STEM education with a specific focus on race, class, gender, and other axes of privilege and oppression. Currently, we develop grants for external funding and compose scientific papers to be delivered at academic conferences and within peer-reviewed scholarly journals.

2017 – 2018, Postdoctoral Scholar, Dr. Shane Brown, Oregon State University

Work with Dr. Brown consists of scholarship across three major NSF-funded projects exploring conceptual knowledge and representation in engineering science courses, interdisciplinary communities of practice, and efforts to develop cultures of inclusion by leveraging design principles.

- Author NSF research proposals, serving as PI and co-PI.
- Developed and implemented a qualitative study exploring faculty perceptions of teaching evaluation.
- Engage with the College of Engineering Change Team to drive diversity efforts and broaden participation.
- Advise M.S. and Ph.D. students and serve on graduate committees.

- Gain expertise with quantitative procedures such as survey item development and factor analyses.
- Leverage communities of practice theories to build interdisciplinary coalitions of STEM educators and change makers.

2013 – 2017, Graduate Research Assistant, Dr. Marie Paretti, Virginia Tech

Work with Dr. Paretti has focused on a wide range of research topics and qualitative approaches. I have experience with planning, executing, and managing large scale projects and have expertise in many different analytical strategies.

- Led in the planning and organization of data collection procedures for a multi-institute, nationwide study, collecting qualitative and quantitative data from approximately 70 recent engineering graduates in workplaces across the country.
- Coded over 500 responses to reflective writing prompts to categorize and monitor students' metacognitive development throughout an engineering statics course.
- Worked with an interdisciplinary team to develop a coding scheme to categorize metacognitive awareness through writing-to-learn prompts in engineering statics.
- Developed a codebook through thematic analysis that characterizes student perceptions of capstone learning outcomes.
- Collected and analyzed interview data to understand perceptions of mentoring in senior design project-based courses.
- Developed and implemented interview protocols for students and instructors to capture salient perceptions of mentoring and problem-based learning (PBL) facilitation practices.
- Analyzed qualitative interview data from mentors and instructors to understand mentoring functions and cognitive apprenticeship in senior design (capstone)
- Conducted detailed field observations of project-based courses in both engineering design and entrepreneurship contexts.
- Analyzed interview data with senior design instructors to investigate how different teaming conflicts are resolved.

2015 – 2017, Graduate Research Assistant, Dr. Walter Lee, Virginia Tech

Work with Dr. Lee has focused on ways in which engineering educators can better support students from underrepresented populations as well as exploring students' perceptions of and motivational beliefs about diversity education within engineering curricula.

- Helped develop a survey tool called "Anchored Open-ended" questions which combines qualitative and quantitative data into a single item for novel analytical approaches.
- Used student retention theories to analyze the beliefs and practices of administrators of various support centers for underrepresented students in engineering.
- Developed an expanded codebook using Expectancy-Value Theory to explore graduate and undergraduate engineering students' conceptions of diversity in

engineering and motivation for learning about such topics within an engineering curriculum.

- Conducted extensive literature searches on diverse topics and provided synthesis of information to inform subsequent research. Some topics included: Faculty development and motivation; lifelong learning and self-authorship in engineering; and diversity and inclusion efforts.
- Developed and conducted interviews to explore engineering students' conceptions of diversity and its relevance within an engineering classroom.

SERVICE AND PROFESSIONAL MEMBERSHIPS

2019 – Present, Member of the American Association of Colleges and Universities

2019 – Present, Reviewer for *Engineering Studies*

2019 – Present, Reviewer for the *Journal of Professional Issues in Engineering Education and Practice*

2018 – Present, Mechanical Engineering Diversity and Inclusion Committee, Cal Poly

2018 – Present, Dean's College of Engineering Diversity and Inclusion Committee, Cal Poly

2017 – Present, Reviewer for the *International Journal of Mechanical Engineering Education*

2015 – Present, Reviewer for the *International Journal of Engineering Education*

2015 – Present, Reviewer for the *Journal of Engineering Education*

2014 – Present, Reviewer for American Society for Engineering Education

2017 – 2018, Member, Practitioner Learning Community dedicated to Socially Just, Inclusive Engineering Teams, Oregon State

2015 – 2019, Reviewer for IEEE Frontiers in Education conference

2015 – 2016, President, American Society for Engineering Education Student Chapter at Virginia Tech (ASEESCVT)

2014 – 2015, Vice President, American Society for Engineering Education Student Chapter at Virginia Tech (ASEESCVT)

2013 – 2014, Information Resource Officer, American Society for Engineering Education Student Chapter at Virginia Tech (ASEESCVT)

2012 – Present, Member, American Society for Engineering Education, (ASEE)

2011, Community outreach in Pulaski County, VA, Astronomy education