Project Coordinators

Greg J. Strimel, Ph.D.
Dr. Greg J. Strimel is an assistant professor of engineering/technology teacher education at Purdue University in West Lafayette, Indiana. Strimel’s efforts are to enhance the appropriately scaffolded teaching of P-12 engineering by studying engineering design-based instructional interventions and engineering design cognition. Previously, Strimel was a teaching assistant professor of engineering fundamentals at West Virginia University where he also served as the university director of K-12 initiatives. Prior to his time at West Virginia, he served as a high school career and technology education department chair, engineering/technology secondary teacher, and an infantryman in the U.S. Army. Strimel earned a B.S. and M.Ed. in technology education and a Ph.D. in STEM education. He has authored several curriculum projects and publications focused on P-12 practices in engineering design. Strimel has been recognized as a New Technology & Engineering Teacher of the Year, Emerging Leader in Engineering/Technology Education, and 21st Century Fellow in the International Technology & Engineering Educators Association.

Michael E. Grubbs, Ph.D.
Dr. Michael Grubbs is the Supervisor for Technology Education, and Manufacturing, Engineering, and Technology Programs for Baltimore County Public Schools. Previously, Dr. Grubbs was a middle school Technology and Engineering Education teacher for Clayton County Public Schools. Dr. Grubbs earned a B.S. and M.Ed. in technology education, an Ed.S in Workforce Education from the University of Georgia, and a Ph.D. in Curriculum and Instruction: Integrative STEM Education from Virginia Tech. He has published and presented nationally and internationally, primarily on his dissertation topic, K-12 design cognition. Dr. Grubbs has been recognized as an Emerging Leader in Engineering/Technology Education, a 21st Century Fellow in the International Technology & Engineering Educators Association, a Technical Foundation of America Fellow and participant in Christ Church, New Zealand, and Donald Maley Spirit of Excellence: Outstanding Graduate Student Citation awardee.

Tanner Huffman, Ph.D.
Tanner Huffman is an assistant professor in the K-12 Engineering and Technology Education Program, Department of Integrative STEM Education, School of Engineering at The College of New Jersey (TCNJ). Before joining the faculty at TCNJ, Dr. Huffman was the Director of Research, Assessment and Special Projects at the International Technology and Engineering Educators Association (ITEEA). While at ITEEA, he secured funding from the National Science Foundation, the Kuwait Foundation for the Advancement of Sciences, the Utah governor’s office of economic development, and several other private foundations with the goal to provide high quality STEM curriculum and professional development to all students. Dr. Huffman continues to serve ITEEA as a senior advisor and consultant. He is a strong advocate for K-12 Engineering Education with experience as a middle and high school Engineering and Technology Education teacher and a focus on social relevance and empowerment. Dr. Huffman has published in international journals and presented at regional, state, national and international conferences. He is also a committee member on the National Academy of Engineering project “Educator Capacity Building in PreK-12 Engineering Education”. Dr. Huffman has served as a board member for ASEE’s PCEE Division and as an advisor for Carnegie Mellon University's CREATE Lab Satellite Network.
Project Participants

Ali Anderson

Originally from Newark DE, Ali Anderson moved to Morgantown, WV in 2010 to start her college career at West Virginia University studying Biometric Systems. While she loved studying engineering, teaching younger kids about the discipline was her true passion. This led her to continue her studies, obtaining a Master’s Degree in Higher Education Administration in 2017. During this time, Ali worked as a graduate assistant in the Freshmen Engineering Program (FEP) which turned into a full time position as the Curricular Outreach Program Coordinator. In this role, she teaches freshmen engineering courses, advises nearly freshmen students, and works with K-12 teachers to help grow STEM education in their classrooms. Ali is an active leader in the Society of Women Engineers at both the local and national level.

Scott Bartholomew, Ph.D.

Scott Bartholomew is an assistant professor of Engineering/Technology Teacher Education at Purdue University. Bartholomew completed his BS and MS degrees in Technology Education at Brigham Young University before obtaining a teaching license and teaching middle school Technology & Engineering classes for three years. Dr. Bartholomew completed a PhD in Curriculum and Instruction at Utah State University where he taught undergraduate courses and was honored as the graduate teacher of the year. Dr. Bartholomew has been heavily involved with ITEEA, serving on the conference planning committee, as a competitive event coordinator, and as the National Competitive Event Coordinator. Publishing in both teacher-practitioner and research journals, Bartholomew has been awarded the top peer-reviewed article and the top volunteered article in the past 3 years. His research efforts revolve around open-ended design problem assessment, adaptive comparative judgment, design portfolios, and teacher development.

Bradley Bowen, Ph.D.

Bradley Bowen is an assistant professor at Virginia Tech in the Integrative STEM Education program. His research focuses on incorporating more engineering activities into K-12 curriculum, and providing engineering and integrative STEM-related PD for in-service teachers. Bradley has a bachelor’s and master’s degree in civil engineering, 5 years of corporate work experience, a Ph.D. in Technology Education, and 6 years of high school teaching experience. Prior to Virginia Tech, Dr. Bowen spent six years at North Dakota State University as an assistant professor duel appointed with the School of Education and the College of Engineering. He has multiple publications and conference presentations related to integrative STEM and engineering education. He has served in various roles on several National Science Foundation grants working with classroom teachers to incorporate engineering concepts, active learning strategies, and a more integrative approach to student learning. Dr. Bowen is a member of several professional organizations including the International Technology and Engineering Educators Association (ITEEA), the Association for Middle Level Education (AMLE), and the National Association of Rocketry (NAR). He is a member of ASEE and has served in various leadership roles for the Pre-College Engineering Education (K-12) division.
Project Participants

Scott Greenhalgh, Ph.D.
Scott Greenhalgh is an associate professor and program coordinator for Technology and Engineering Education at the University of Northern Iowa where he teaches courses in Curriculum Development, Facilities Management and Planning, Principles of Engineering, Methods of Teaching Technology Education, Construction Systems, Construction Graphics and Building Information Modeling. Dr. Greenhalgh’s educational interests include service learning in real-world contexts engaging students with tiny house construction for the homeless and designing and developing pk-12 STEM manipulatives in Panther Education Products. His research interests include cognitive processes in the engineering, technological, and creative design processes. Scott did his graduate work at Utah State University where he received his MS in Engineering and Technology Education, and PhD in Curriculum and Instruction with emphasis in Engineering and Technology Education. Prior to joining the faculty at the University of Northern Iowa, Scott has worked in a civil engineering firm doing structural detail work and worked as an architectural designer for eight years.

Liesl Krause
Liesl Krause is a first year PhD student in the Weldon School of Biomedical Engineering at Purdue University. She graduated from Villanova University with a degree in electrical engineering in 2016. During her time at Villanova, she mentored other engineering students, was a TA, and a tutor. Liesl greatly enjoys helping fellow students and hopes to one day become a professor. In the past, she has been recognized by the Society for Applied Spectroscopy for outstanding research as an undergraduate student. Her current research involves designing radiofrequency coils for MRIs to explore traumatic brain injury.

Nolan Fahrer
Nolan E. Fahrer is currently a doctoral student and Teaching Assistant Professor in the Technology, Engineering, and Design Education program within the College of Education at North Carolina State University. Nolan earned his Bachelor of Science degree in Technology from Bowling Green State University and later earned his Master of Science degree in Technology Education from North Carolina State University. Nolan is National Board Certified Teacher and has taught for over 10 years in secondary education in Michigan, Ohio, and North Carolina in the areas of Technology Education, Basic and Advanced Woodworking, and Technical Graphics. His teaching specialties include technical graphics, constraint-based parametric 3D modeling, and teaching methods in technology and engineering education. His research interests include visual literacy, assessment in education, and STEM-based pedagogy.
Project Participants

Scott Nichols
Scott Nichols is the Technology Education Supervisor for the Maryland State Department of Education (MSDE), overseeing Technology and Engineering Education and K-12 Computer Science and Project Lead the Way (PLTW) implementation. Prior to MSDE, Mr. Nichols worked as an Engineering Department Chair for the Baltimore County Public Schools (BCPS). While working with BCPS, Mr. Nichols received the 2016 International Technology and Engineering Educators Association (ITEEA) Teacher Excellence Award for Maryland, the 2015-2016 Technology and Engineering Educators Association of Maryland (TEEAM) Engineering and Technology Education Teacher Award of Excellence, as well as several County Council and Governor Citations for Excellence in Science, Technology, Engineering, and Mathematics (STEM) Education. Mr. Nichols has presented at the National Science Teachers Association (NSTA) annual STEM Forum and Expo and has been published in several journals including Technology and Engineering Teacher and Technological Horizons in Education. Mr. Nichols strongly advocates for equity and accessibility in Technology and Engineering Education and is working to ensure that current Maryland programs are centered on 21st century, competitive skills. He currently serves on the National Computer Science Education Week and Hour of Code Advisory Committee and the Maryland Title I Committee of Practitioners.

Anita S. Deck, Ed.D.
Anita S. Deck, Ed.D. is Director of Innovation, Assessment, and Research at ITEEA’s Stem Center for Teaching and Learning. A former public school teacher with 13 years of experience, Anita earned her Bachelor of Science degree in Education from Concord University with certifications in general science, biology, chemistry, and physics. She also holds a Master of Science degree in Science Education from West Virginia University and is a graduate of the Integrative STEM Education doctoral program at Virginia Tech. Anita served as the Science Specialist for the Eisenhower Math and Science Appalachian Consortium, the STEM Specialist and WV Liaison for Appalachia Regional Comprehensive Center, and the Director of WV Parent Connections (Title I). As President of the Deck Innovation Group, Dr. Deck designed, developed and implemented professional development for elementary and secondary teachers, as well as mentored and supervised instructional coaches throughout the academic year. She is a member of Phi Kappa Phi, Kappa Delta Pi, and Golden Key International honor societies. Her research interests focus on enhancing science teaching in elementary teachers through technological/engineering design-based learning.

Claudia Morrell
Ms. Morrell is a senior consultant for global and US-based organizations. She was recently appointed to the UN IFAP working group on Information Literacy. In the U.S., Ms. Morrell is a consultant for the Baltimore County Public Schools in Maryland, the U.S. Department of Education; the Pennsylvania Department of Education; the Allison Group (an evaluation organization); Johns Hopkins University School of Education; and the University Of Pittsburgh (Pitt) Swanson School of Engineering (SSoE); among others. Her decades of work have focused on understanding and enacting efforts to increase access and educational equity for women and other underrepresented groups to quality education in science, technology, engineering, and mathematics leading to high quality, family-supporting careers. Ms. Morrell is a both a practitioner and researcher with a B.S. from the University of North Carolina-Chapel Hill, an M.S. from the University of Wisconsin-Madison, and an M.A. from Loyola University Maryland.
**Project Participants**

**Greg Pearson**
Greg Pearson is a Scholar with the National Academy of Engineering (NAE) in Washington, D.C. Greg currently serves as the responsible staff officer for two NSF-funded projects, one examining the status, role, and needs of engineering technology education in the United States, the other addressing issues related to capacity building for K-12 engineering educators. He also directs the Chevron-funded LinkEngineering online resource that is helping guide implementation of PreK-12 engineering education in the United States. Previously, he has overseen projects addressing: STEM integration in K-12 education; standards for K-12 engineering education; the status and prospects for engineering in K-12 education; new messaging for the field of engineering (Changing the Conversation); technological literacy; and content standards for the field of technology education. He has degrees in biology and journalism.

**Edward M. Reeve, Ph.D.**
Dr. Edward M. Reeve is a professor and teacher educator in the area of Technology and Engineering Education (TEE) in the School of Applied Sciences, Technology and Education at Utah State University (USU) and is currently serving as an interim vice provost. He has been at USU since 1987 where he has worked to advance knowledge in the fields of Technology and Engineering Education and Career and Technical Education (CTE). His professional interests, research, and numerous publications and presentations have been in areas related to educational standards, curriculum development in science, technology, engineering, and mathematics (STEM) education, competency-based education, improving teaching and learning, and internationalizing the curriculum. He received his bachelor’s, master’s, and doctorate degrees in Education in Industrial Technology from The Ohio State University. In addition to experiences as a secondary education teacher and university administrator, he currently serves on the Praxis Standing Committee for Technology Education and served on the national pilot study panel for the National Assessment of Educational Progress: Technology and Technology and Engineering Literacy (TEL) Assessment in 2015. He has also served as President (2010-2013) of the Council on Technology and Engineering Teacher Education (CTETE) and is currently (2017-2018) serving as President of the International Technology and Engineering Educators Education Association (ITEEA).

**Steve Barbato**
Steve is the Executive Director/CEO for the International Technology and Engineering Educators Association (ITEEA). Steve has served in this position since January 2013. He brings ten years of classroom teaching in technology education in Pennsylvania, six years as State Supervisor for Technology Education at the Delaware Department of Education, five years in private business and thirteen years as a school district administrator in Pennsylvania (Lower Merion School District) as a Director of Curriculum, as well as Science and Technology Education Supervisor. Steve is focusing his efforts to provide leadership in carrying out ITEEA’s mission to advance technological and engineering understanding and capabilities for all students preK-12! The ultimate goal is for ITEEA is to meet the professional needs and interests of its members, its STEM constituents and colleagues, as well as to improve public understanding of technology, innovation, design, and engineering education and its contributions for all. -- *Technology and Engineering Brings STEM To Life!* 😊
Project Participants

Kenneth Reid, Ph.D.
Kenneth Reid is the Assistant Department Head for Undergraduate Programs in Engineering Education at Virginia Tech. He was a member of the first cohort in Engineering Education at Purdue University and earned his Ph.D. in 2009 from Purdue. He and his coauthors were awarded the William Elgin Wickenden award for 2014, recognizing the best paper in the Journal of Engineering Education and awarded Best Paper, ERM Division of ASEE in 2014. He was awarded an IEEE-USA Professional Achievement Award in 2013 for designing the nation’s first B.S. degree in Engineering Education. He was named NETI Faculty Fellow for 2013-2014, and the Herbert F. Alter Chair of Engineering (Ohio Northern University) in 2010. The Tsunami Model Eliciting Activity, co-designed by Reid and implemented in an Indianapolis area middle school, was named the Middle School Curriculum of the Year for 2009 by the Engineering Education Service Center. His research interests include success in first-year engineering, engineering in K-12, and international service and engineering. He is active in engineering within K-12, serving on the Technology Student Association (TSA) Board of Directors, and engineering international service learning, serving on the Board of Directors of Solid Rock International. He has written four textbooks (with another soon to be released).

Douglas Handy
Since July 2014, Douglas Handy has been the coordinator of the office of Career and Technology Education (CTE) for Baltimore County Public (BCPS) Schools, MD, where he plans, coordinates, and manages programs related to CTE; supervises a staff of 13, including curriculum supervisors, resource teachers, technical representatives, and administrative professionals; and ensures that BCPS’ CTE programs address and support the system-wide goals and priorities identified in Blueprint 2.0: Our Way Forward. In 2015, the BCPS CTE office earned the Outstanding CTE Marketing Campaign award from the Maryland State Department of Education. From July 2008 to June 2014, Mr. Handy was a curriculum supervisor in BCPS’ CTE office, focusing on programs in technology education and engineering. In March 2013, he received the Outstanding Local Supervisor Award from ITEEA’s Council for Supervision and Leadership. He served as the president of the Technology and Engineering Educators Association of Maryland (TEEAM) during the 2010-2011 school year and received TEEAM’s Leadership Award in 2010. Before joining BCPS, Mr. Handy was a CTE specialist with the Maryland State Department of Education (MSDE), focusing on programs in technology education, engineering, and family and consumer sciences. Prior to his time with MSDE, Mr. Handy was a teacher at Wilde Lake High School in Howard County Public Schools in Maryland. During his five years at Wilde Lake, he taught technology education and Project Lead The Way Engineering. He also served as the instructional team leader for the school’s CTE programs. Before embarking on a career in education, he worked as a manufacturing process engineer for six years. Mr. Handy holds a Maryland educator certificate with technology education and administrator I and II endorsements. He has a Master of Science degree in Curriculum and Instruction with a Concentration in Administrative Leadership from McDaniel College and a Bachelor of Science Degree in Chemical Engineering from North Carolina Agricultural & Technical State University.
Project Participants

Michael Hacker, Ph.D.
Michael Hacker co-directs the Center for STEM Research (CSR) at Hofstra University in New York and has conceived, written, and directed/co-directed 14 large-scale National Science Foundation-funded projects (about $35M in funding) focused on K-14 STEM teaching and learning. During over 50 years in education, Hacker was a classroom teacher, department supervisor, and university educator. As the New York State Education Department Supervisor for Technology Education, he co-managed the development of New York’s Standards for Mathematics, Science, and Technology. He was a member of the Standards for Technological Literacy writing team. Hacker has authored six textbooks, numerous journal articles, and co-edited several scholarly compendia and international conference proceedings. He is a member of the ITEEA Academy of Fellows.

Cary Sneider, Ph.D.
Cary Sneider is Associate Research Professor at Portland State University in Portland, Oregon, where he teaches courses in research methodology in a Master of Science Teaching degree program. Dr. Sneider is Chair of the LinkEngineering committee for the National Academy of Engineering. He was the lead consultant on engineering to the National Research Council committee that developed A Framework for K-12 Science Education: Practices, Crosscutting Concepts and Core Ideas, and served in a similar role on the writing team for the Next Generation Science Standards. In 2011 he joined the National Assessment Governing Board, which sets policy for the National Assessment of Educational Progress (NAEP), also known as “The Nation’s Report Card.” Before moving to Oregon Dr. Sneider was Vice President for Programs at the Museum of Science in Boston. Sneider earned a BA degree in Astronomy at Harvard College, and a California Secondary Teaching Credential, Master of Arts Degree, and PhD in Science Education at the University of California, Berkeley.

Ellen Browne
Ellen is a Texas Instruments National Instructor and lives at the Pomfret School in Pomfret, CT. After teaching music for 25 years, she switched over to teaching math in 2003 and then she added engineering in 2014. She has always been captivated by the possibilities of TI technology in both subjects. Ellen enjoys students, teaching, conducting TI workshops and is passionate about helping students and educators attain their goals. Outside of school, Ellen loves being a mom of three, a wife to an awesome calculus teacher, cooking, gardening, and being creative.
Project Participants

Andrew Jackson
Andrew is a PhD student in the Engineering and Technology Teacher Education program through Purdue's Polytechnic Institute. He completed his undergraduate training at Brigham Young University, as well as a MS in Technology Leadership and Innovation and Instructional Design Certificate at Purdue University. He previously taught middle school and undergraduate technology and engineering design classes, accompanying these experiences with classroom research to improve practice. As a graduate student Andrew has participated in outreach programs to deliver hands-on STEM problem-solving opportunities for gifted learners. His design teaching focuses on understanding of design contexts and users, and informed design-making. Andrew is the recipient of a 2015 Ross Fellowship from Purdue University and has been recognized as a 21st Century Fellow of ITEEA. His research interests are engineering self-efficacy, motivation, and decision-making in design.

Mary Rinehart
Mary Rinehart is the Engineering and Technology Specialist for the Indiana Department of Education. Mrs. Rinehart brought five years of teaching experience as well as a legacy of involvement in FIRST Robotics with her to the IDOE. Mrs. Rinehart is a strong advocate for equity and access to engineering education and is currently working to bring Engineering by Design and Technology Student Association to Indiana. She also started a statewide Teacher Recruitment Taskforce for Engineering and Technology and currently serves as the chair of the Teacher Recruitment Taskforce for ITEEA. Last year Mrs. Rinehart was the recipient of the ITEEA CSL Outstanding State Supervisor Award. She is currently working on a Master’s Degree in Curriculum, Instruction, and Educational Technology at Ball State University.

George Krause
George has been employed with Westinghouse/Northrop Grumman Corporation for the past 37 years. His career has spanned various aspects of engineering and manufacturing, including assignments within the Systems Engineering organization, the test design functionality, as well as manufacturing engineering. George has also had the responsibility of serving as a Director of functional engineering groups, and program management assignments. Currently, he has the role of Manufacturing Strategic Operations director for the Missions Systems sector. George has earned a BSEE degree from University of Maryland College Park, as well as a Technical Management degree from University of Maryland, and a Master of Science in Church Management from the Villanova University School of Business. He is an Eagle Scout, and has over 30 years of adult volunteer service with the Boy Scouts of America. George completed a four year formation program at St. Mary’s Seminary, which led to his ordination as a Deacon within the Catholic Church in 2013.
Project Participants

Jennifer Buelin, Ph.D.
Dr. Jennifer Buelin is Director of the ITEEA STEM Center for Teaching and Learning, which houses ITEEA’s curriculum, assessment, research, and professional development initiatives. Following 12 years in the secondary classroom, she has published and presented on methods of fostering and assessing creativity in technology and engineering education, and has focused recently on doing so within a framework for integrative STEM education driven by the Grand Challenges for Engineering. She currently serves on the editorial review board for the Technology and Engineering Teacher and has served as a reviewer for several divisions of the American Society for Engineering Education. Dr. Buelin graduated from Campbell University with a BA in Studio Art and Theatre Arts and Wake Forest University with an MA in Liberal Studies with a dramaturgy emphasis. She earned National Board certification in Career and Technical Education/Arts and Communications, and her Ed.D. from NC State, where she taught courses in Graphic Communications and Technology, Engineering, and Design Education on the NC State faculty in the Department of STEM Education.

Wade Goodridge, Ph.D.
Dr. Wade Goodridge is an Assistant Professor in Engineering Education at Utah State University. Prior to this position Dr. Goodridge was a Principal Lecturer in Engineering at a Utah State University Regional Campus in Brigham City Utah. Dr. Goodridge has taught a variety of foundational engineering courses in these capacities. Prior to this work, Dr. Goodridge was a Technology Education Teacher for nearly 3 years in both Middle and High Schools in Cache Valley Utah. He is a 21st Century Fellow for the International Technology & Engineering Education Association and has multiple awards for Undergraduate Research Mentoring and Teaching. Dr. Goodridge earned a B.S. in Industrial Teacher Education as well as a B.S. in Civil and Environmental Engineering. He then continued his education with a M.S. and Ph.D. in Civil and Environmental Engineering with research focused on hydraulic modeling and sediment transport as a research assistant at the Utah Water Research Laboratory. Dr. Goodridge currently leads research in spatial cognition, distance education, and professional development. He has published and presented extensively in Engineering Education journals and conferences and actively consults in curriculum development. Additionally, he continues to consult and research in areas of hydraulic and environmental engineering. Dr. Goodridge is a member of ASEE, ASCE, ISEP, AERA, and ITEEA

Susheela Shanta
Susheela Shanta earned her bachelor’s degree in Civil Engineering from India, and a Master of Urban Planning degree from the SUNY at Buffalo, NY. Susheela practiced as a municipal planner in Philadelphia, PA, and then, as a planner and later as planning director in Harrisburg, PA. After moving to Virginia in 1995, Susheela worked in community development, redeveloping inner-city neighborhoods, urban main streets, creating housing for seniors and families in low-income communities, while also preserving historic buildings and districts. Since 2009, she has been teaching math and engineering courses, and directing the engineering program in the Governor’s STEM Academy in Roanoke County, VA. Having started on her I-STEM ED doctoral program at Virginia Tech in 2012, Susheela is expecting to complete her dissertation work this year. Her research interests are in developing, and investigating students’ problem solving and critical thinking skills within an engineering design-based pedagogical approach in high school.
Carolyn Parker, Ph.D.
Carolyn Parker is the Director of the Master of Arts in Teaching Program in the School of Education. Dr. Parker’s current research focus is twofold, focusing on teacher education and issues of equity and access in STEM education. Most recently, Dr. Parker was a principal investigator of a 7.4 million dollar National Science Foundation Math-Science Partnership award, STEM Achievement in Baltimore Elementary Schools (SABES). The SABES project served nine high poverty Baltimore City elementary schools by improving STEM curriculum and instruction. The project included research focused on the development and delivery of rigorous curriculum supported by intensive and sustained teacher professional development that included in-school coaching, peer classroom visits and content intensive STEM Academies. In addition to the school day component, the project offered a STEM-focused, out-of-school day program where students completed engineering-focused projects relevant to local communities. Dr. Parker’s has authored numerous book chapters, technical reports, and peer-reviewed papers. Her work appears in the Journal of Research in Science Teaching, Science Education, and Cultural Studies in Science Education. Prior to her arrival at American University, Dr. Parker taught the Johns Hopkins School of Education and the George Washington University. Dr. Parker earned her bachelor’s degree in Biology from Binghamton University (formally SUNY-Binghamton). She began her career as a science educator as a Peace Corps volunteer in Guatemala. Upon her return to the United States, she earned an M.A. in science teaching and then taught high school science in New York State and Miami, Florida. Dr. Parker earned her Ph.D in Curriculum and Instruction from the University of Maryland College Park.

Liz Parry
Liz Parry is an engineer, engineering educator and consultant. Liz worked for IBM for ten years in various engineering and management roles after earning her engineering management/mechanical engineering degree at the University of Missouri Rolla (now Missouri University of Science and Technology). She has held a position at The Engineering Place at North Carolina State University’s College of Engineering for over 15 years and her current appointment is as an Engineering Education Scholar in the Dean’s office. Liz has worked with the Engineering is Elementary (Museum of Science Boston) team for 10 years as a consultant and research partner/Co-PI. In addition, she has served as a partner and/or Co-PI on multiple grants from the National Science Foundation, the GE Foundation, National Institutes of Health and the Department of Education. In addition to teaching first year engineering at NC State, Liz conducts both EiE and integrated stEm professional development and coaching for Discovery Education and others. She was the founding chair of Board of Directors committee on P12 Engineering Education for the American Society of Engineering Education and led the 12000-member organizations recently concluded “Commit to P12 Engineering” effort. Liz is a frequent speaker in the US and abroad, and has authored over 50 papers and articles and three book chapters on engineering education. In 2015, President Barack Obama awarded her the prestigious Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring (PAESMEM) for her decades long work with students from groups underrepresented in STEM. Liz was elected as a Fellow in the American Society for Engineering Education in 2016.
Project Participants

Susheela Shanta

Susheela Shanta earned her bachelor’s degree in Civil Engineering from India, and a Master of Urban Planning degree from the SUNY at Buffalo, NY. Susheela practiced as a municipal planner in Philadelphia, PA, and then, as a planner and later as planning director in Harrisburg, PA. After moving to Virginia in 1995, Susheela worked in community development, redeveloping inner-city neighborhoods, urban main streets, creating housing for seniors and families in low-income communities, while also preserving historic buildings and districts. Since 2009, she has been teaching math and engineering courses, and directing the engineering program in the Governor’s STEM Academy in Roanoke County, VA. Having started on her I-STEM ED doctoral program at Virginia Tech in 2012, Susheela is expecting to complete her dissertation work this year. Her research interests are in developing, and investigating students’ problem solving and critical thinking skills within an engineering design-based pedagogical approach in high school.

Taryn Melkus Bayles, Ph.D.

Taryn Melkus Bayles is a Professor, Teaching Track, of Chemical Engineering in the Chemical & Petroleum Engineering Department at the University of Pittsburgh, and serves as the Vice Chairman of Undergraduate Education. She has spent part of her career working in industry with Exxon, Westinghouse and Phillips Petroleum. Her industrial experience has included process engineering, computer modeling and control, process design and testing, and engineering management. She has also spent over 20 years teaching Chemical Engineering at the University of Nevada Reno, University of Pittsburgh, University of Maryland College Park and the University of Maryland Baltimore County. In her courses she incorporates her industrial experience by bringing practical examples and interactive learning to help students understand fundamental engineering principles. Under her leadership, as the Undergraduate Program Director at UMBC, the program enrollment more than quadrupled and averaged 30-50% minority/underrepresented students. She has developed and led over 110 workshops with over 5500 participants for K-12 students, K-12 pre-service/in-service teachers, college students and faculty members. Her current research focuses on Engineering Education and Outreach. The goal of this research is to increase awareness of and interest in pursuing engineering as a career, as well as to understand what factors help students be successful once they have chosen engineering as a major. She is the co-author of the INSPIRES (INcreasing Student Participation, Interest and Recruitment in Engineering & Science) curriculum which introduce high school students to engineering design through hands-on experiences and inquiry-based learning with real world engineering design challenges. This curriculum targets the International Technology and Engineering Education Association Standards as well as National Next Generation Science Standards and aligns with the Framework for K-12 Science Education. She has been the PI or co-PI on $6.6 M NSF grants which focus on support and mentoring for undergraduate students (S-STEM, CSEMS, REU), K-12 outreach (STEP) and K-12 curriculum development & teacher professional development (DRL, ESIE, EEC). She was awarded the University System of Maryland Regents Award for Collaboration in Public Service and the University System of Maryland Regents Award for Excellence in Mentoring, these are the highest awards given for faulty achievement in the University of Maryland system. She is a Fellow of the American Institute of Chemical Engineers, and serves as the Education Division Chair of AIChE, the faculty advisor of the University of Pittsburgh AIChE student chapter and CHEM-E-Car team and serves on the Publications Board of Chemical Engineering Education.
Project Participants

Amy Sabarre
Amy Sabarre is the Director of K-12 Education for Harrisonburg City Public Schools in Harrisonburg VA. Sabarre began 7 years ago creating vertical K-12 Integrative STEM education programs in Harrisonburg and has continued to grow her school systems programs and commitment to STEM education. Before coming to Harrisonburg, Amy worked in DC Public Schools as a STEM coordinator and in Martinsville, VA as the Director of the NASA Science, Engineering, Math and Aerospace Academy. Amy is a strong advocate for STEM education and has been working with key stakeholders in Virginia to create the Virginia STEM Learning Network. Sabarre has consulted with many school divisions in Virginia to create STEM programming and curriculum. Mrs. Sabarre has presented at many state and national conferences, published articles and won several awards.

Ruth Akers
Ruth Akers is a CTE Resource Teacher for Baltimore County Public Schools (BCPS). She received her Bachelor of Science in agriculture from the University of Maryland, College Park and a Master in Technology Education from the University of Maryland, Eastern Shore. Prior to teaching, Ms. Akers worked in electronics manufacturing and was a production manager for a biotech company manufacturing High Performance Liquid Chromatography (HPLC) materials for research. Ms. Akers changed careers and began teaching middle school science and technology education. After receiving her master’s degree, she began teaching high school technology education students for BCPS and also served as a department chair for technology education and engineering. Ms. Akers has received both middle and high school Teacher Excellence Awards from the International Technology and Engineering Educators Association (ITEEA). Ms. Akers has also been a session presenter at numerous ITEEA conferences. Recently, Ms. Akers contributed an article for the Technology and Engineering Teacher (February 2017, A Journey To Increase Student Engagement). Ms. Akers is passionate about students. She believes there should be a holistic approach to teaching which involves knowing students before introducing students to learning experiences.

Chris Buckler
Chris Buckler is currently the department chair of the PLTW Engineering and Carpentry programs at Owings Mills High School in Baltimore County. He obtained his Bachelor of Science in Engineering Education from the University of Maryland, Baltimore County and his Masters in Career and Technology Education from the University of Maryland, Eastern Shore. Chris has earned his PLTW certification in five courses. Before beginning his teaching career, Chris served five years as a United States Marine, working in the field of aviation radio repair. While in this role, he troubleshooted and repaired communication equipment at Camp Pendleton, CA for the Direct Air Support Central (DASC). Chris is a former president of the Technology and Engineering Educators’ Association of Maryland (TEEAM) and has served as a robotics mentor for seven years. While serving as a robotics mentor, his students earned six qualifications for the VEX Robotics World Championships. He has partnered with Baltimore County and TEEAM to provide robotics professional development to local and state-wide audiences.
Project Participants

**Alisha Sparks**

Alisha Sparks currently serves the Elementary School STEM Program Manager at the Center for Educational Outreach at Johns Hopkins University. Prior to joining Johns Hopkins, she worked for Baltimore City Public Schools, Baltimore CDF Freedom Schools and the Center for Women and Information Technology at the University of Maryland Baltimore County. In addition to her professional experience, she had done extensive work in her local community and abroad by serving with organizations such as In His Presence Ministries, W.J. Thompson, Jr. Ministries, Girl Scouts of Central Maryland and the International Partnership for Service Learning. Her passion is working with young people and helping them to succeed. Alisha firmly believes that “it is easier to build strong children than to repair broken men [and women]” as stated by Frederick Douglas. Alisha is a proud alumna of Voorhees College (Denmark, SC) and the University of Maryland Baltimore County (Baltimore, MD), where she earned her Bachelor of Science in Mathematics and Master of Arts in Instructional Systems Development, respectively.

**Christine Newman**

Christine Newman is the Assistant Dean of Engineering Educational Outreach. She runs the Johns Hopkins University Whiting School of Engineering Center for Educational Outreach and has grown the programs to reach over 3500 K-12 students per year. She has a B.S. in Mechanical Engineering from Virginia Tech and a MBA from Marshall University. Christine has worked in chemical manufacturing, environmental consulting, software development, and financial services. She is on the board of the Mid-Atlantic Girls Collaborative Network and the Maryland Science Olympiad and spearheaded STEM career days with Girls Inc. of DC.

**Marie Hoepfl**

Dr. Marie Hoepfl is professor and graduate program director in the Department of Sustainable Technology and the Built Environment at Appalachian State University. She taught technology education at the middle and high school levels for six years, and has worked at the university level since 1994. Hoepfl’s professional engagement has included serving as a program officer at the National Science Foundation (2001-2002); various officer roles within the Council of Technology and Engineering Teacher Education, for which she is currently Past-President (2016-2019); editing the *Journal of Industrial Teacher Education* (2000-2002); serving on the editorial review boards of several scholarly journals, including *The Technology Teacher* and the *International Journal of Technology and Design Education*; and numerous collaborations with state departments of education on curriculum development, teacher professional development, and project evaluation efforts. Hoepfl has presented and published widely on topics related to assessment, technology education, and sustainability.
**Project Participants**

**Emily Yoshikawa**
Emily Yoshikawa is a graduate student in Engineering and Technology Teacher Education at Purdue University. She graduated from Brigham Young University in Technology and Engineering Education in 2016. At BYU, Emily worked as a TA, peer mentor, and research assistant. Her undergraduate research was focused on elementary teacher’s self-efficacy for and beliefs about teaching computing and engineering as well as computational practices in K-8 around the world. Emily has been recognized by ITEEA with the TEECA Student Leadership award during her undergraduate studies. Her current research interests are centered on open-ended design problem assessment, adaptive comparative judgment, and elementary engineering curriculum development.

**Kevin Sutton**
Kevin Sutton is a lecturer and doctoral candidate in the Technology, Engineering, and Design Education program at NC State University where he teaches a variety of graphics courses. He has a BS in Technology Education from NC State and MAEd from Virginia Tech. Kevin is an active member of ITEEA and the Engineering Design Graphics Division of ASEE. He has received awards such as the Donald Maley Graduate Student Citation and William Warner Graduate Research Award. Along with awards, Kevin has been a 21st Century Leadership Academy Fellow and recognized as a leader to watch through ITEEA. His primary research interests include performance assessment and spatial visualization.

**Eunhye Kim**
Eunhye Kim is a PhD student and graduate research assistant of Technology Leadership and Innovation at Purdue University in West Lafayette, Indiana. Her research interests lie in engineering education, especially engineering design thinking, innovation and entrepreneurship education in engineering, and soft skills for engineers. The research interests and goals have been derived from her academic and professional backgrounds across disciplines. She earned a B.S. in Electronics Engineering and an MBA in South Korea and then worked as a product development engineer and an IT strategic planner before joining the PhD program. Especially, she had experiences in various projects to formulate IT strategic plans and develop IT project implementation plans. As a graduate research assistant, she is currently engaged in engineering design cognition research projects.
Project Participants

Angela Waldrop
Angela Waldrop is currently a high school teacher in a magnet Engineering program at Eastern Technical High School in Baltimore County. She obtained her Bachelor of Science in Mechanical Engineering from University of Maryland Baltimore County and her Masters in Education from University of Maryland Eastern Shore. Angela also has a Professional Engineer certification for Maryland, specializing in Machine Design. Before beginning her teaching career, Angela worked as a Drafter at the Coast Guard in Curtis Bay, Maryland and as a designer/engineer at Black and Decker in Towson, Maryland. Angela has been awarded the ITEEA Donald Maley Spirit of Excellence Outstanding Graduate Student Citation, and the MESA (Math Engineering Science Achievement) Outstanding Teacher of the Year. Angela has also worked with Baltimore County Public Schools and ITEEA to develop Technology Education and Engineering curriculum for High School students. In addition, she has worked with the Community College of Baltimore County to write and deliver courses in the Engineering Technology program and also for Continuing Education certification. These courses include Statics, Strength of Materials, Processes and Methods, and Plastics Manufacturing. Angela has also presented STEM related topics at the NSTA and Magnet Schools of America Conferences.

Ralph C. Olson
Ralph is a Technology Education teacher for Baltimore County Public Schools working at Sollers Point Technical High School. Ralph received his bachelor’s degree from the University of Wisconsin-Stout in Industrial Arts Education. After teaching for three years Ralph transitioned to the printing industry where he served in quality and systems improvement specialist. Ralph’s efforts produced reduced order entry time and increased customer satisfaction. Returning to education in 2003 Ralph received his master’s degree in Technology Education from the University of Maryland Eastern Shore. Ralph has received Program Excellence awards from TEAM. He has also served on the TEAM board of directors for six years ending those efforts with an outstanding STEM Expo for professional development. Ralph has collaborated with Math and Science department to write new curriculum models and updated and revise others. He was recently recognized as Manufacturing Champion of Maryland in the fall of 2016 by the Regional Manufacturing Industry of Maryland, RMI. Ralph currently serves as the Executive Director of the Maryland Society of High School Engineering Programs, MSHSEP in Maryland. The society’s mission is to aid in the development of engineering relationships between; students, family, education and the professional community.
Project Participants

Gary R. Bertoline, Ph.D.

Dr. Gary R. Bertoline is the Dean of the Purdue Polytechnic Institute and a Distinguished Professor of Computer Graphics Technology and Computer & Information Technology at Purdue University. He earned his PhD at The Ohio State University and was on the faculty in the College of Engineering for 3 years before coming to Purdue University in 1990. Gary served as founding Department Head of Computer Graphics Technology then led the creation of the Rosen Center for Advanced Computing and the Envision Center for Perceptualization. He co-founded the Indiana Next Generation Manufacturing Competitiveness Center (IN-MaC) as well as the Polytechnic Institute initiative at Purdue University. The Polytechnic initiative is a major effort to transform the college’s curricula and learning experience for the students to better prepare graduates for life and work in the digital age. Gary also is the visionary leader for the Purdue Polytechnic High School – Indianapolis a charter school that opened on July 31, 2017.

He has authored numerous papers in journals and trade publications on engineering and computer graphics, computer-aided design, and visualization research. He has authored and co-authored seven textbooks in the areas of computer-aided design and engineering design graphics with one, Fundamentals 3D Solid Modeling and Graphics Communications currently in its 7th edition. Gary’s research interests are in scientific visualization, interactive immersive environments, distributed and grid computing, workforce education and STEM education. Before entering higher education, Gary was a middle and high school technology teacher for seven years in Ohio.

Jamie Gurganus

Jamie Gurganus works in the Mechanical Engineering Department at UMBC, focusing in the field of Engineering Education. She also serves as the Associate Director of Engineering Education Initiatives for the College of Engineering and IT at UMBC. Her research is focused on solving problems relating to educating engineers, teachers, and the community. She seeks to identify best practices and develop assessment methods that assist teachers with student engagement, helping them to be successful throughout the STEM pipeline. A few of these key areas include enhancing student's spatial abilities (K-12 and higher education), integrating service learning into the classroom, implementing new instructional methodologies, and design optimization using additive manufacturing.

Jamie collaborates with a number of industry partners and consults throughout Maryland in STEM education. She has received a number of NSF fellowships and NASA grants for research in the engineering education field. Through her role within the College of Engineering and IT she oversees Project Lead the Way, endorsed trainer for Engineering is Elementary and FIRST LEGO league for the state of Maryland.

Jamie has written curriculum published in a number of works, including a workbook to help students learn Statics in effective way. Currently she serves on the assessment team for CS Open (Google and National Girls Collaborative Project), and consults with Wiley publishing. Jamie teaches several mechanical engineering classes at UMBC, holds both and BS and MS in Mechanical Engineering and is currently finishing her PhD.
Robert Oehrli

Robert Oehrli is an Engineering/Technology Education teacher at Catonsville High School in Baltimore County. He obtained his Bachelor of Science in Mechanical Engineering and a Masters of Arts in Teaching from University of Maryland in Baltimore County (UMBC). Robert served as a teaching assistant for UMBC’s freshman engineering classes for two years and then realized he had a passion for engineering education. In 2015 Baltimore county hired him to start a Project Lead the Way program at Catonsville High School which has grown to over 200 students in just two short years. This summer Robert got trained in his 5th PLTW class. Recently, Robert has run professional development sessions for Baltimore County training teachers on Autodesk Inventor, and how to safely operate and maintain their school’s 3D printers. Last fall Robert contributed an article to the Technology and Engineering Teacher (August 2016, Float Your Boat: Making Instant Design Challenges Meaningful and Relevant). He is also very involved in the Maryland FIRST Lego League community and serves as a state planning committee member, tournament director, and head referee.

Shane Evans

Shane Evans is the President of the New Jersey Technology and Engineering Educators Association, and a Technology, Engineering, & Design teacher at the Freehold Regional High School District. Shane has earned a M.S. in Industrial Design from Philadelphia University and holds a B.S. in Pre-Engineering/Technology Education from The College of New Jersey. Utilizing fundamental and innovative technology gives this approach a life of its own. While technology is an important resource to innovation, design methods and practices are fundamental to identifying and solving problems in an enterprising and useful way. A designer/engineer must think of solutions that have the ability to achieve proper form, function, desirability, manufacturability, affordability, cultural reference, and so on. With today’s world being so technologically dependent, it is important to merge design with technology in ways that are not only unique but also relevant.