COLLEGE OF EDUCATION ENGAGEMENT REPORT 2021

PURDUE UNIVERSITY

College of Education

FOREWORD

We are committed to making the College of Education an equitable and welcoming environment for all. We are taking steps toward making the College and the campus more welcoming, tolerant, and inclusive, with focus on the recruitment and retention of historically underrepresented students.

The College of Education acknowledges that Purdue University is located in the traditional homelands of the Woodland People. We honor and appreciate these indigenous caretakers which include the Bodéwadmik (Potawatomi), Lenape (Delaware), Myaamia (Miami), and Shawnee people. This acknowledgement shall be used by faculty, staff, and students at their discretion.

DR. NANCY MARCHAND-MARTELLA

SUZI AND DALE GALLAGHER DEAN,

COLLEGE OF EDUCATION

PURDUE UNIVERSITY

WEST LAFAYETTE, INDIANA

COLLEGE OF EDUCATION ENGAGEMENT REPORT – 2021 YEAR

Purdue University College of Education
Beering Hall, 100 N. University Street
West Lafayette, IN 47907
(765) 494-2341
education@purdue.edu

COLLEGE OF EDUCATION ENGAGEMENT REPORT – 2021 YEAR

Purdue's College of Education is dedicated to launching the future through the discovery and development of human potential. That's a lofty vision, yet one that equitable access to education can make possible. Through our research, scholarship and teacher preparation, we work to effect positive change and transform the lives of learners of all ages and ability in a variety on contexts both formal and informal. For nearly 110 years, we have seen that vision become reality – and realize that even as much is accomplished, there remains much to do. With respect to our engagement and impact as we meet the land grant mission of Purdue University, it is important to note that approximately 80% of our teacher education graduates choose to remain in Indiana, working as education professionals, including teachers and administrators.

The mission of the College of Education at Purdue University is to:

- Advance scientific discovery related to learning and human development.
- Prepare outstanding teachers and intellectual leaders to thrive in a pluralistic society.
- Maximize educational outcomes through inspired teaching, research, and public service.

To further its mission the College of Education strives to:

- Create a culture of discovery.
- Deliver an innovative and responsive professional curriculum.
- Empower faculty, staff, and students to effect positive change in a diverse society.
- Engage in cross-disciplinary collaboration to address critical educational challenges at all levels.
- Inform educational programs and policy.
- Attract and retain stellar, diverse faculty, staff, and students.

Goals are:

- Foster research and scholarship that creates knowledge and transforms the practice of education.
- Strengthen educational programs that prepare outstanding professionals.
- Build P-12 partnerships that reflect a shared, collaborative vision and commitment to excellence in teaching and learning.
- Model the inclusiveness of diverse ideas, cultures, and people.
- Improve faculty and staff development, retention, and support.

P-12 Schools

- **Clinical Partnerships:** Program faculty and our P-12 partners work together to design, implement, and evaluate candidates' field experiences and clinical practice. Program faculty and school partners design and implement a unique set of course-related field experiences that allow candidates to apply and reflect on content, professional knowledge, pedagogy, content pedagogy, and professional dispositions throughout the Teacher Education program. Field experiences that are connected to foundational courses allow candidates to observe in-service teachers and assist with basic instructional tasks. As candidates gain more experience working in classroom settings, their fieldwork and clinical practice spiral to match.

  Purdue has multiple partnerships within the local area, the state, and nationwide. The standard agreement and partnership are articulated through our Affiliation Agreement. This document details the roles of both the Office of Clinical Practices and the partner school corporations. Purdue ensures mutually beneficial partnerships in a variety of ways. The tuition credit voucher program is in its twenty-sixth year. It is a way of saying "thank you" to school corporations for the mentorship they provide to Purdue students in early field experience courses. A tuition credit voucher allows a teacher to take a class at Purdue for free.

  The Innovation Initiative, the complete revision of our undergraduate teacher licensure program, launched a new component of clinical experience, beginning in the 2021-2022 academic year. For the first time, our teacher candidates had structured engagement with non-school community partners. The College worked with over 60 local agencies, non-profits, and youth organizations so our candidates could gain first-hand experience and knowledge with local k-12 students and their families outside of a school setting.

  To ensure close relationships and participation in the assessment and decision-making process of clinical experiences, the COE sponsors the Teacher Education Advisory Board (TEAB). The charge and design of this board are outlined below:

  Purpose of Advisory Board: to participate in and collaborate with the Teacher Education Program (TEP) at Purdue on decisions related to the development, implementation, and revision of its programs and operations, particularly clinical partnerships and practice to ensure P-12 student learning.

- **The Susan Nierstheimer Memorial Book Fund:** During the 2020-21 fiscal year, the Susan Nierstheimer Memorial Book Fund was able to deliver 2,358 books to 262 students from six different local schools.

  Since 2006, the Susan Nierstheimer Memorial Book Fund has gifted nearly 13,000 books to over 3,000 students from various central Indiana elementary schools.

Each year, first graders that have participated in school-based reading intervention programs receive books to recognize their progress and encourage them to continue to develop their reading skills. The books are purposefully chosen from children's literature to facilitate the students' progress.

This year, with help from College of Education faculty members, nine new titles were selected to deliver to each child. The bags included six books that the student should be able to read independently and three that could be read to them. Also included were two nonfiction books and one book that is in both Spanish and English. The new titles chosen were:

- Big Red Barn by Margaret Wise Brown
- The Very Busy Spider by Eric Carle
- Mi Corazon se Llena de Alegria/My Heart Fills with Happiness by Monique Gray Smith
- Biscuit by Alyssa Satin Capucilli
- Let's Go Mo by David A. Adler
- Wemberly Worried by Kevin Henkes
- One is a Pinata: A Book of Numbers by Roseanne Greenfield Thong
- Same & Different by National Geographic
- I Believe I Can by Grace Byers
- Alma and How She Got Her Name by Juana Martinez-Neal

The books are presented in the familiar bright blue bag imprinted with the book fund logo. Each book includes a custom bookplate with the following inscription: "A gift for you from the Susan L. Nierstheimer Book Fund. Fulfilling a dream by putting books in the hands of children."

Asunda, Paul, Faculty in Engineering and Technology Teacher Education

- NSF (2021), $325,009: Characterizing How Teachers Design Engaging Learning Environments in STEM Education is a Building Capacity in STEM Education Research Project. Dr. Paull Asunda, PI, will investigate teachers' conceptions of integrated STEM teaching and learning and how their conceptions influence the design of classroom experiences that engage students in these learning environments. Dr. Asunda will collaborate with five rural and diverse K-12 Indiana schools (16 teachers and 500+ students) that are designated as STEM teaching schools by the Indiana Department of Education. It is anticipated that the findings will identify critical methodological issues and theoretical links between integrated STEM instruction and learning environments that support student engagement for future research efforts, including teacher professional development opportunities in STEM education and student career choices in STEM fields.
- Purdue Polytechnic Institute Seed Grant (2021) $12,000: Dr. Paul Asunda (Co-PI), in collaboration with a team of professors in Purdue's School of Aviation and Transportation Technology and Embry Riddle Aeronautical University in Florida, is developing curriculum training materials based on findings from research focused on mitigating fatigue in

professional flight students. The curriculum consists of three modules, (a) causes and symptoms of fatigue, (b) best practices for sleep and healthy lifestyle, and (c) decision-making related to what student pilots may face today and what they may face in the future workplace. It is anticipated that this fatigue training program will change behaviors in over 1000 students at Purdue University. In addition, it will help student pilots develop healthy lifestyle habits and decision-making skills as they become safer student pilots not only at Purdue University but also across the broader aviation community.

Bolshakova, Virginia, Indiana Gear Up (https://www.purdue.edu/indiana-gear-up/), Indiana Teachers/schools.

- Indiana GEAR UP – Teacher Professional Development: Social Emotional Learning and FAFSA Training. Walker Career Center, Indianapolis, IN. November 2021 (45 attendees, 6 hour training)
- Indiana GEAR UP Teacher Retreat and GEAR UP Professional Development, Clifty Inn, Clifty Falls State Park, IN. August 1-3, 2021 (18 staff attended*3 day workshop)
- Indiana GEAR UP Statewide SAT Workshops for Indiana Teachers Professional Development, 10 workshops from May-July (485 teachers attended *4 hours/person) Indiana GEAR UP STEAM Leadership Institute. Purdue University. June 14-17. (45 student attendees, 3.5 day program)
- Indiana GEAR UP Statewide Bridge to College Virtual Program Hosted by Purdue Brightspace for High School Students. (106 student attendees*6 hour/person)
- Indiana GEAR UP Teacher and Building Coordinator Training and GEAR UP Conference, Indiana State Library. June 2-4, 2021 (42 attendees*3 day workshop)
- Indiana GEAR UP Project Based Learning Professional Development (Virtual), March 6, 2021 (55 attendees*6 hours/person)
- Indiana GEAR UP STEM + College & Career Focused Afterschool Clubs at 11 Indiana High School Partner Locations (over 1000 student attendees*2-3 hours/week): Arsenal Tech HS, Charlestown HS, Crawford County HS, Gary West Side, Jeffersonville HS, Kokomo HS, Lafayette-Jeff High School, Maconaquah HS, Muncie Central HS, Purdue Polytechnic HS, Warren Central HS

Bryan, Lynn, Faculty in Physics Education and Director of CATALYST

- PK-12 STEM Engagement Faculty Fellow, Office of Engagement
- Societal Impact Fellows Program Faculty Mentor
- NSF (2021) $1,838,015: Integration of Engineering Design and Life Science: Investigating the Influence of an Intervention on Student Interest and Motivation in STEM Fields. In this project, Drs. Selcen Guzey (PI), Lynn Bryan (Co-PI), Kari Clase (Co-PI), and Muhsin Menekse collaborate with teachers in Tippecanoe County Schools and Anderson Community Schools to provide long term professional development on project-designed, PBL-based, integrated STEM units to allow middle school science teachers to meaningfully integrate engineering in their life science classes and support teachers as they implement the STEM units during the academic year. This project involved 35 middle school teachers reaching more than 5500 students over the project's lifetime. In 2021, we expanded the project to include a new program:

Inclusive Science Education Professional Development Program: Developed and delivered a year-long, online PD for 11 science teachers from local school districts to help them increase their understanding of and practices of equity-focused, asset-based science teaching. NSF (2021) $2,641,415: Sensing Science through Modeling Matter. Teachers received professional development in science content as well as the pedagogical content knowledge for teaching states of matter and phase changes using modeling-based, discourse-rich science instruction that includes iPads and a tool called the Thermoscope. In addition, teachers taught over the course of 4 weeks in their Kindergarten classroom, while my team provided materials set-up, instructional coaching, and just-in-time teaching support. (Also listed with Co-PI, Dr. Selcen Guzey)

- NSF (2021) $2,641,415: Sensing Science through Modeling Matter (S2M2) is a $2.6 million National Science Foundation-funded research grant with an engagement component. Drs. Lynn Bryan (PI) and Ala Samarapungavan (Co-PI) collaborated with Concord Consortium to develop and research inquiry-based, modeling-based curriculum to support early science kindergarten learning of concepts involving matter and its changes. In 2021, we devoted effort to disseminating scholarship related to this project that involved four kindergarten teachers from Hershey Elementary, two kindergarten teachers from Oakland Elementary, and four kindergarten teachers from Chelmsford, Massachusetts. (Also listed under Co-PI, Dr. Ala Samarapungavan)
- U.S. Department of Education (2021), $5,177,290: The Indianapolis STEM Teacher Residency (ISTR) project is a collaborative partnership between Indianapolis Public Schools (IPS) and Purdue University and is led by Drs. Lynn Bryan (PI) and Selcen Guzey (Co-PI). The overall vision of ISTR is to strengthen the educational outcomes of students in IPS by preparing culturally competent, highly qualified career STEM teachers who will elevate student achievement in middle and high school science (including computer science), technology, engineering, and mathematics. The ISTR program is designed for prospective science and mathematics teachers with a bachelor's degree in a STEM-related field. ISTR participants will complete an Interdisciplinary Master of Science degree in Secondary STEM Education with Initial Licensure and the K-12 Integrated STEM Graduate Degree Certificate within 18 months. Participants complete an academic year-long residency in an IPS school as part of the Interdisciplinary Master of Science degree in Secondary STEM Education with Initial Licensure. Immediately following the completion of state licensure requirements and university coursework, ISTR teachers will be employed full-time in IPS. The 2021 cohort consists of 6 prospective teachers. Partnering schools in IPS include Arsenal Tech High School, Longfellow Middle School, and George Washington High School. (Also listed with Dr. Suazo-Flores who serves as the liaison between Purdue and IPS serves as the liaison between Purdue and IPS)

Capobianco, Brenda, Faculty in Science Education

- NFS (2021) $2,018,951: UPDATE Summit – Integrating engineering design Designed and directed a two-day conference with science teacher educators
- NSF (April 2021-November 2021) $2,018,951: SLED Workshop - Realigning Design with Three-Dimensional Learning. Facilitated a series of two full-day workshops with Lafayette School Corporation teachers on using engineering design to foster three-

dimensional learning in STEM education.

Guzey, Selcen, Faculty in Biology Education**,** CATALYST Assoc. Director of Research Initiatives

- NSF (2021) $1,838,015: Integration of Engineering Design and Life Science: Investigating the Influence of an Intervention on Student Interest and Motivation in STEM Fields. In this project, Drs. Selcen Guzey (PI), Lynn Bryan (Co-PI), Kari Clase (Co-PI), and Muhsin Menekse collaborate with teachers in Tippecanoe County Schools and Anderson Community Schools to provide long term professional development on project-designed, PBL-based, integrated STEM units to allow middle school science teachers to meaningfully integrate engineering in their life science classes and support teachers as they implement the STEM units during the academic year. This project involved 35 middle school teachers reaching more than 5500 students over the project's lifetime. In 2021, we expanded the project to include a new program: Inclusive Science Education Professional Development Program: Developed and delivered a year-long, online PD for 11 science teachers from local school districts to help them increase their understanding of and practices of equity-focused, asset-based science teaching. (Also listed with Co-PI Dr. Lynn Bryan)

Koehler, Adrie, Faculty in Learning Design and Technology

- NSF (01/01/20-12/31/22) $1,989,709.00 / $65,860.44: Development, Deployment, and Evaluation of Instructional Modules for Current and Future Practitioners of Model-Based Systems Engineering. (PI: Audeen Fentiman, Engineering Education) (Program Evaluator: Koehler, Adrie)

Menekse, Muhsin, Faculty in Engineering Education

- NSF (2021) $1,838,015: Integration of Engineering Design and Life Science: Investigating the Influence of an Intervention on Student Interest and Motivation in STEM Fields. In this project, Drs. Selcen Guzey (PI), Lynn Bryan (Co-PI), Kari Clase (Co-PI), and Muhsin Menekse collaborate with teachers in Tippecanoe County Schools and Anderson Community Schools to provide long term professional development on project-designed, PBL-based, integrated STEM units to allow middle school science teachers to meaningfully integrate engineering in their life science classes and support teachers as they implement the STEM units during the academic year. This project involved 35 middle school teachers reaching more than 5500 students over the project's lifetime. In 2021, we expanded the project to include a new program: Inclusive Science Education Professional Development Program: Developed and delivered a year-long, online PD for 11 science teachers from local school districts to help them increase their understanding of and practices of equity-focused, asset-based science teaching.

Mentzer, Nathan, Faculty in Engineering and Technology Teacher Education

- NSF (2021) $1.26 million: Learning by Evaluating: Engaging Students in Evaluation as a Pedagogical Strategy to Improve Design Thinking aims to develop, refine, and test an educational innovation in which 9th-grade students evaluate sample work as

a starting point in engineering design cycles. The project will work directly with DeKalb County School District in Atlanta, Georgia, and connect to an internationally implemented 9th-grade course offered through the International Technology and Engineering Educators Association STEM Center. The project team, led by Dr. Nathan Mentzer (PI), combines design education researchers from Purdue, Brigham Young, and the University of Georgia, the director of the International Technology and Engineering Education Association's STEM Center, and the Career Technical and Agricultural Education Instructional Coordinator for the DeKalb County School District. The project engages ten teachers in Georgia. Project outcomes include the development of a research-based curriculum and approximately 500 students this year and will increase to about 1000 for the next few years.

- NSF (2021) $746,412: Dr. Mentzer and a team of colleagues recently launched Co-Robots to Enhance Motivation and Self-efficacy in Formal STEM Education. Funded by the National Science Foundation, this project is a partnership between high school teachers in Indiana, the Purdue College of Engineering, and the Purdue Polytechnic Institute. Teachers collaborate with the Purdue team to learn ways of increasing and enhancing robotics instruction in high school schools, with the goal of attracting and sustaining underrepresented students' interest in STEM as well as developing awareness of STEM careers. Teachers will contribute to piloting, optimizing, and testing the efficacy of the robotics curriculum and associated robotics hardware. More than 20 teachers from Indiana and Georgia and over 1500 public-school students from diverse backgrounds will be reached.
- Dr. Mentzer leads the Engineering by Design workshops for Purdue undergraduate elementary education majors. Engineering by Design (EbD) was developed by the International Technology and Engineering Education Association. Workshop participants engage in project-based, inquiry-based integrated STEM instruction while learning how to teach lessons from the EbD curriculum, which is based on the Standards for Technological and Engineering Literacy, as well as national standards for science and math and the NAE's Grand Challenges for Engineering. Workshop completers received a Technology, Engineering, Environment, Mathematics and Science (TEEMS certificate), a complimentary subscription to Technology and Engineering Teacher (TET), ITEEA's flagship publication, and one-year access to the entire EbD curriculum. To date, ten students have completed the workshop and are classroom ready to implement integrated STEM lessons. CATALYST will soon be offering EbD workshops for secondary teachers as well.
- NSF (2021) $599,980: Expanding Accessibility of Learning through Blended Synchronous Instruction of F2F and Remote Students is a 3-year, $599,980 grant funded by the National Science Foundation. The goals of the project are to (1) develop, test, and use teaching practices and curricular innovations that will engage students and improve learning, persistence, and retention in STEM, and (2) colleges and universities to implement and sustain highly effective STEM teaching and learning. The project team, led by Dr. Nathan Mentzer, will examine active learning strategies in blended synchronous instructional environments to further define HyFlex as an educational model, optimize the approach, and study the efficacy of student learning and sense of community. This project will annually impact at least 1,500 and 10 graduate students during the project period but have a growing and

lasting impact long after the project has ended.

Morita-Mullaney, Trish, Faculty in Literacy Education

- Extended teacher cohort model for ELL and DL licensure with the Indiana Department of Education leading to enrollment of new educators throughout the state (Impact: $618,750.00 for 2020-21 school year, 14 districts and 120 teachers), lead applicant and supervisor.
- Indiana Dual Language Immersion Network: Collaborates with IDOE dual language leaders and district and school administrators on implementational challenges as Indiana programs are new and developing. She has conducted various sessions for DLI leaders and stakeholders, presenter and facilitator.
- Indiana Department of Education English Learner Leadership Group: Furnish interpretation and implementational challenges for their ELLs student community, shaping Indiana educational and language policy. Further, it has increased enrollment in the ESL licensure program at Purdue, presenter and facilitator.
- Wabash Valley Educational Service Center: Continued advisement with the Wabash Valley Education center to identify the educational needs of ELLs in consortium schools, facilitator.
- Professional and Parental Understanding for Equity in Dual Language Education (PUEDE) and Leveraging the Lectura y Lenguaje [Literacy & Language]: A Collaborative Scale Up of Literacy and Language for ELs in Central Indiana https://puede.education.purdue.edu/

Newby, Tim, Faculty in Learning Design and Technology

- Indiana Governor's Emergency Education Relief Fund (GEER) (03/2020-0/9/2022). $1.6M. Becoming an Online Teacher Even When I Didn't Sign Up for It. During the pandemic it became necessary for P-12 teachers to be able to efficiently convert much (if not all) of their classroom instruction from face-to-face to hybrid and online. A hybrid and online teaching hub was created that offered teachers support, instruction, guidance, and materials to facilitate their efficient and effective transition to hybrid and online class instruction.

Newton, Jill, Faculty in Mathematics Education

- Co-Developing a Curriculum Coherence Toolkit with Teachers (C3T2) is an NSF-funded collaborative research project with mathematics education faculty and graduate and undergraduate students at Duquesne University, Michigan State University, and the University of Arizona. The research team, led by PI, Dr. Jill Newton, seeks to understand how upper elementary teachers make decisions about their mathematics curriculum in the context of the limitless availability of online resources. In this study, the research team investigates how teachers use curriculum materials, think about curricular coherence, and how their decisions about curriculum lead to student learning. In Phase I of the project, they conducted a national survey of teachers to understand the range of curriculum contexts in which teachers are working and the decisions teachers make when they select and adapt curricular resources. The team is in the early stages of Phase II, in which they will be interviewing teachers in four different contexts about curricular use, coherence, and collegial collaboration.

- GEMS (Girls Excelling in Math and Science) clubs were started in 1994 to encourage students, especially girls, to pursue education and careers in STEM fields, particularly technology, engineering, and related high-paying, entrepreneurial enterprises. GEMS clubs strive to ensure that a child sees themselves as a change agent or a problem-solver, a possible technology entrepreneur, engineer or scientist, and person who makes a difference. Led by the team of Drs. Jill Newton, Elizabeth Suazo-Flores, Signe Kastberg, Rachael Kenney, Laura Bofferding, and Laura Jones, GEMS came to Purdue and CATALYST in 2018, and we are currently building capacity for growing the GEMS club network both in Indiana and around the world. (also listed with Suazo-Flores and the Center for Advancing the Teaching and Learning of STEM, CATALYST)

Rapoport, Anatoli, Faculty in Social Studies.

- US Department of State (2021) (Funding was a part of the $250,000 grant): Benjamin Franklin Transatlantic Fellows Summer Institute. A 4-week international online summer institute for 65 students from 46 countries. It includes academic, social, and cultural components. Sponsored by US Department of State.
- Office of VP of Engagement (2021) (Funds on my discretion): GK-12/ Graduate Engagement in K-12. Involvement of graduate students in education; introduction of Middle School students to research; university – local school collaboration

Samarapungavan, Ala, Faculty in Educational Studies

- NSF (2021) $2,641,415: Sensing Science through Modeling Matter (S2M2) is a $2.6 million National Science Foundation-funded research grant with an engagement component. Drs. Lynn Bryan and Ala Samarapungavan collaborated with Concord Consortium to develop and research inquiry-based, modeling-based curriculum to support early science kindergarten learning of concepts involving matter and its changes. In 2021, we devoted effort to disseminating scholarship related to this project that involved four kindergarten teachers from Hershey Elementary, two kindergarten teachers from Oakland Elementary, and four kindergarten teachers from Chelmsford, Massachusetts. (Also listed under Co-PI, Dr. Lynn Bryan)
- NSF (2021) $1,336,062: Exploring Biological Evidence: Helping Students Understand the Richness and Complexity of Evidentiary Constructs in Biology (EBE) is a $1,336,062 National Science Foundation-funded research grant with a significant engagement component. A cross-disciplinary team of researchers comprised of Drs. Ala Samarapungavan, Kari Clase, Stephanie Gardner, and Nancy Pelaez collaborated with five high school and seven undergraduate biology instructors in Indiana to create rich and authentic laboratory inquiry activities with embedded scaffolds (written and dialogic supports) for evidentiary thinking and reasoning with laboratory data. Analyses of student learning from the activities based on students' laboratory reports as well as pre and post-tests of evidentiary reasoning showed that students who participated in the scaffolded activities showed gains in conceptual understanding of core biology concepts as well as the scientific evidence for these concepts.

Suazo-Flores, CATALYST Research Associate

- GEMS (Girls Excelling in Math and Science) clubs were started in 1994 to encourage students, especially girls, to pursue education and careers in STEM fields, particularly technology, engineering, and related high-paying, entrepreneurial enterprises. GEMS clubs strive to ensure that a child sees themselves as a change agent or a problem-solver, a possible technology entrepreneur, engineer or scientist, and person who makes a difference. Led by the team of Jill Newton, Elizabeth Suazo-Flores, Signe Kastberg, Rachael Kenney, Laura Bofferding, Laura Jones, GEMS came to Purdue and CATALYST in 2018, and we are currently building capacity for growing the GEMS club network both in Indiana and around the world. (Also listed under Jill Newton and the Center for Advancing the Teaching and Learning of STEM, CATALYST)
- U.S. Department of Education (2021), $5,177,290: The Indianapolis STEM Teacher Residency (ISTR) project is a collaborative partnership between Indianapolis Public Schools (IPS) and Purdue University and is led by Drs. Lynn Bryan (PI) and Selcen Guzey (Co-PI). Dr. Suazo-Flores serves as the liaison between Purdue and IPS. The overall vision of ISTR is to strengthen the educational outcomes of students IPS by preparing culturally competent, highly qualified career STEM teachers who will elevate student achievement in middle and high school science (including computer science), technology, engineering, and mathematics. Partnering schools in IPS include Arsenal Tech High School, Longfellow Middle School, and George Washington High School. (Also listed under PI, Dr. Lynn Bryan)

Walker, William, CATALYST Assistant Director of Programs and Partnerships

- Indiana Department of Education (2021) ($140,000, $173,000): Dr. Bill Walker (co-PI), Assistant Director of Programs and Partnerships at CATALYST, and Dr. David Feikes (PI), Professor at Purdue University Northwest, were awarded two grants for the Math Recovery Project. The Math Recovery Project provides one week of professional development for teachers with activities and materials that promote math recovery for high-needs students. The project includes approaches that focus on significant mathematical tasks, social and emotional learning, small-group work and whole-class discussion, and students becoming autonomous learners. The Math Recovery Project started in summer 2021 with seven workshops for 58 teachers who worked with over 1,100 students. Additional workshops are planned for summer 2022 and summer 2023.

Wang, Hui-Hui, Faculty in Agricultural Sciences Education and Communication

- IN-VISION Professional Development Program. (2021). Tri-County, LaPorte, Portage, West Washington, Riley, and Purdue Polytechnic high school CTE and STEM teachers.

Watson, Sunnie, Learning Design and Technology

- United States Agency for International Development (2021) $9,989,774: Dr. Hui Hui Wang is a co-PI) for a Purdue University—Cornell University collaboration of scientists developing programs to improve food safety in Bangladesh, Kenya, Ethiopia, Senegal, and Cambodia. Feed the Future Innovation Lab for Food Safety is funded by a $9,989,774 grant from the United States Agency for International Development

(USAID) to establish what is said to be the first-ever Feed the Future Innovation Lab for Food Safety (FSIL).

- U. S. Department of Agriculture/National Institute of Food and Agriculture (2021) $300,000. Industry-Driven Integrated STEM and Systems Approach to Innovative Incubation is a U.S. Department of Agriculture/National Institute of Food and Agriculture grant (2020-2024) in which Purdue scientists from the College of Agriculture co-develop agriculture and iSTEM educational materials that are solidly grounded in agro-ecosystem thinking. This project aims to increase rural high school teachers' agriculture and STEM literacy teaching capacity and equip high school students' system thinking and data-based decision-making skills by solving industry-based, real-world agricultural design challenges from pre-harvest to post-harvest themes. Dr. Hui Hui Wang is the PI and Drs. Neil Knobloch, Roger Tormoehlen, Betty Feng, and Peter Langenhoven are Co-PIs for this $300,000 grant project. Partnering high schools include LaPorte High School, Portage High School, Purdue Polytechnic High School Englewood, Purdue Polytechnic High School North Campus, Riley High School, Tri-County High School, and West Washington High School.
- In partnership with Purdue Polytechnic High School, Dr. Hui Hui Wang (PI) and co-PIs Drs. Neil Knobloch, Roger Tormoehlen, Betty Feng, Petrus Langenhoven are leading this project (2019-2022, $20,000) that combines developing problem-solving skills and entrepreneurial thinking through Incubation Design Challenges (IDCs) in high school classrooms.
- WHIN with Local STEM is a $ 65,649 project (2019-2022) led by Dr. Hui Hui Wang, with co-PIs Drs. Neil Knobloch, Roger Tormoehlen, Betty Feng, and Petrus Langenhoven developed a data-based integrated STEM learning experience with high school teachers/students. WHIN with Local STEM partnering schools include: Benton Central High School, Frontier High School, TriCounty High School

Wessel Powell, Christy, Faculty in Literacy and Language

- Indiana Department of Education Grant totaling $1,123,774 for three school districts from 2021-2023; collaborators include five co-PIs in the College of Education and 12 school district leadership collaborators in TSC, LSC, and Frankfort Schools.

- Spencer Foundation Research Practice Partnership, three years (2021-2023) $400,000: Hearts and Minds Campaign for Equity Hub. My Role: PI, responsible for 33%, in collaboration with Indiana University, University of South Florida, and community partners.

Signature Programs and Centers
Evaluation and Learning Research Center (ELRC)

Active Evaluation And Learning Research Center Projects:

- PERU-Hub totaling $15,000,000. PERU-Hub will enhance the capacity of higher education institutions in Peru to engage in participatory development research that

works with farmers and producers to create and use research that enhances the biodiversity of the Amazon, the engagement of native and women farmers, and the quality of life for farmers in the Peruvian Amazon.

- The Arequipa Nexus Institute for Food, Water, Energy, and the Environment totaling $83,000. Arequipa Nexus Institute is a partnership between Purdue and Universidad Nacional de San Augustin to build capacity and the strategic, long-term collaborations needed to address key environmental, agroeconomic and social challenges that will support development of adaptive, profitable and sustainable food energy-water systems in the Arequipa region of Peru.
- LASER Evaluation of Accelerated Education Programs in Somalia totaling $3.6M. This project will examine the effectiveness of educational models in Somalia to allow USAISD and the Somali Ministry of Education and Higher Education to make data-driven decision-making about replication and scale-up and to provide foundational data that informs benchmarking and policy decisions.
- Long-Term Assistance Services for Research (LASER) PULSE totaling $20,000,000. LASER (Long-term Assistance and Services for Research) PULSE (Partners for University-Led Solutions Engine) is funded through USAID's Innovation, Technology, and Research Hub, to deliver research-driven solutions to field-sourced development challenges in USAID interest countries.
- LASER Buy-In: Building the Evidence Base on Effective Public-Private Sector Engagement totaling $1,012,422. This project examined influential factors leading to positive and productive relationships among USAID, stakeholders, and the private sector through synthesis of detailed desk reviews of the literature from both business management and social science perspectives.
- LASER Buy-In: Building the Evidence Base on Effective Public-Private Sector Engagement -II totaling $1,687,578. Building on the extensive literature review conducted in phase 1, this project will use an iterative ground-truthing approach to verify and contextualize findings and develop a set of best practice for successful public-private partnerships.
- Intercultural assessment of an undergraduate overseas STEM research experience for U.S. students totaling $2000. This project will explore the impact of an international research experience on cultural competencies, attitudes and beliefs, and career plans of undergraduate students.
- Sustainable Medicines in Africa Project. This collaboration between Purdue University and the Kilimanjaro School of Pharmacy focuses on capacity development for the manufacture of quality medicines in Africa, by and for Africans. The project is developing, evaluating and implementing an educational ecosystem that supports the enhancement of regulatory and technical competency of African professionals, the creation of a collaborative culture for drug quality in manufacturing and

regulation and accelerating and sustaining innovations in drug manufacturing developed by African professionals. The ELRC is contributing our expertise in development and evaluation of high impact educational practices, as well as, the monitoring and evaluation of learning networks for capacity development in underserved and under-resourced communities.

Gifted Education Research and Resource Institute (GER²I)

GER²I's mission is holistic development of giftedness, creativity, and talents among individuals throughout their life span. GER²I delivers enrichment programs for gifted, creative, and talented youth; graduate programs for future scholars and leaders; professional development and coursework for educators of gifted, creative, and talented students and cutting-edge research in psychology and education related to giftedness, creativity, and talent development.

GER²I's strategic plan area of engagement focuses on the intention to: **Build educational and financial partnerships to effectively meet the local, state, national, and global challenges in development of giftedness, creativity, and talent.** Highlights of the four engagement goal results are shown below.

Engagement 1. Establish and support exemplary talent development experiences for P-12 students and educators (innovative strategies to enhance academic and affective development; PD to GER²I program staff; secure DIGS funding; GER²I visibility;)

- HOPE+ grant activities
- Graduate assistants continue to be involved in program delivery.
- We have a continued Shell partnership in Chicago with the Murray Language Academy, and we were able to extend STAR/PULSAR scholarships to participants due to the Haviland Whiting Scholarships.
- INSTEM Project (funded by Jacob Javits Gifted and Talented Students Education Act) involves professional development opportunities for teachers and talent development programs for students in middle and high schools.

Engagement 2. Expand, state, Native American, and international components in programs and research (partnerships, active in organizations/agencies)

- Formalized partnership with Sault Ste Marie Ojibwe.
- Formalized partnership with Korean Department of Education, proposed professional development institute at the request of Busan Metropolitan City Institute for Gifted Education and Promotion
- Current Partnerships:
- Arizona: Ganado, Lukachukai, (Navajo Nation)*, Arizona State University*, Young Scholars Academy; Deer Valley Unified School District
- Brazil: State University of Sao Paulo* (UNESP) and Universidade Catolica Dom Bosco (UCDB)*
- Chile: Universidad Catolica del Norte*, Antofagasta; Universidad de Los Andes, Santiago
- China: Beijing Hope Star (Xiaodong); Jiangsu Tianyi High School, China; RDFZ School (Beijing); HiElites (USA & Guangzhou Province)
- Colombia, Ruta N, Medellin; Columbus School, Envigado; Secretary of Education, Medellin; National University of Colombia

- Greece, Thessaloniki
- Illinois: Morton Grove; Murray Language Academy*
- India through www.ei-india.com
- Indiana: Attica*, Benton County*, Blue River Valley*, Brownsburg, Cedar Lake, Crawfordsville*, Danville*, Delphi*, Evansville, Frankfort*, Hamilton Heights, Indianapolis, Lafayette*, Tell City*, Tippecanoe County*, Tipton, West Lafayette*
- Jordan: Yarmouk University
- Korea: Korean Science Academy; Korean Academy for Gifted Education; Gwangju Science Academy, Korea; Korean Department of Education, Soonchunhyang University
- Michigan: Bahweting Anishnabe Public School Academy, Sault Ste. Marie*; Downtown Boxing Gym, Detroit*
- Minnesota: Mille Lacs Band of Ojibwe*
- (The) Netherlands: Radboud University
- New Mexico: Navajo Prep, Farmington; San Juan College High School
- South Dakota: McLaughlin (Standing Rock Reservation)*
- Spain: Campion International
- Texas: Houston Independent School District
- Tennessee: Memphis, REACH; Nashville, Vanderbilt University*
- Saudi Arabia, Mawhiba International Programs
- TSCG sites in GA, IA, IL, IN, MN, NE, OH, SC, WI*
- Los Angeles Unified School District (1 elementary and 1 middle school)
- Houston Independent School District (1 middle school, 1 high school)
- Herberger Academy at Arizona State University
  Private schools and agencies: Bridges Academy, Los Angeles; The Summit Center, Walnut Creek, CA

Note. * Indicates research *and* engagement partnership

Engagement 3. Develop cross-cultural materials and workshops related to GCT studies (diversity

- MCA-Arabic validation study published, and it has been translated into Spanish and is being translated into Turkish.
- TSCG is in Arabic. HOPE scale in Arabic
- MCA-Korean; SPOCQ-Korean; LSI-Korean; MCA-Chinese; SPOCQ-Chinese, HOPE Scale-Korean (See Appendix E).
- HOPE+ Scale and Technical Manual are being used and presented by others, as well as translated and validated in Spanish.
- Certificate in Gifted, Creative and Talented Studies is in full operation.

Engagement 4. Emphasize talent development of P-12 students and their educators in Indiana

- Sponsor Hazel Feldhusen Classroom Teacher Award at IAG each year.
- GER^{2}I graduate students serve as TA in undergraduate programs in Purdue teacher education.
- Formal professional development in 2019 in Morton Grove, IL and local schools (not including TSCG sites).
- INSTEM Project included partnerships with two schools in Indiana (Tell City and Danville): Professional development for teachers and talent development programs for middle and high school students.
- Kristen represents GERI well in Indiana and at Purdue as follows
  - Board of Directors, Indiana Association for the Gifted, summer 2019 - present

- High Ability Virtual Learning Task Force, Indiana Department of Education, fall 2020 - present
- Purdue College of Education Teacher Preparation Program Reform Work Group, June 2019—present
- Faculty Preceptor, Purdue Honors College, fall 2020 - present
- Purdue University Libraries Committee Member, June 2019 – present
- Purdue College of Education/EDST Department Representative, Curriculum Committee Member, fall 2018 – present

- GER²I faculty and staff frequently speak to groups about GCT

Center for Advancing the Teaching and Learning of STEM (CATALYST)

The Center for Advancing the Teaching and Learning of STEM (CATALYST) focuses on improving STEM (science, technology, engineering, mathematics) education for students from preschool to college. The center (1) conducts theoretically grounded research that contributes to our understanding and advancement of K-12 STEM education; (2) develops partnerships and research collaborations with other institutions, businesses, and agencies that support the advancement of K-12 STEM teaching and learning; and (3) informs policy and public support of STEM teaching and learning at the local, national, and global levels. In this document, we report the major engagement-related activities conducted by CATALYST from January 2021 to December 2021.

2021 Indiana STEM Education Conference

CATALYST sponsored the sixth annual Indiana STEM Education Conference held virtually on January 15, 2021. The theme for the 2021 conference was "STEM Education Meets a Global Challenge." This year's Indiana STEM Education Conference provided opportunities to learn about effective STEM education strategies, curricula, and resources to help teachers and students navigate learning STEM disciplines during the global pandemic. We engaged 5 Purdue undergraduates and 22 Purdue graduate students in the conference activities. And more than 400 STEM teachers/educators from the following 85 school districts attended the 2021conference:

Archdiocese of Indianapolis, Barr-Reeve Community Schools, Beech Grove City Schools, Benton Community School Corporation, Bluffton-Harrison MSD, Carroll Consolidated School Corporation, Crawford County Community Schools, Culver Community Schools, Danville Community School Corporation, DeKalb County Central United Schools, Eminence Community School Corporation, Evansville Vanderburgh School Corporation, Fayette County School Corporation, Fort Wayne Community School, Frankton/Lapel Community Schools, Gary Community School Corporation, Godwin Heights Public Schools, Goshen Community Schools, Greater Jasper Consolidated School Corporation, Greencastle Community School Corporation, Greensburg Community School Corporation, Hamilton Southeastern Schools, Hasten Hebrew Academy of Indianapolis, Horizon Christian School, Indiana Horizon Academy, Indiana Math and Science Academy – North, Indianapolis Public Schools, Kokomo School Corporation, Lafayette Catholic School System, Lafayette School Corporation, LaPorte Community School Corporation, Lebanon Community School Corporation, Lewis Cass Schools, Manchester Community Schools, Michigan City Area Schools, Monroe County Community School Corporation, MSD Decatur Township, MSD

Lawrence Township, MSD of Martinsville, MSD of New Durham Township, MSD of Steuben County, MSD Pike Township, MSD Warren Township, MSD Washington Township, MSD Wayne Township, Muncie Community Schools, New Albany - Floyd County Consolidated School Corporation, New Castle Community School Corporation, North Daviess Community Schools, North Lawrence Community Schools, North West Hendricks School Corporation, Oregon Davis School Corporation, Penn-Harris-Madison School Corporation, Pike County School Corporation, Pioneer Regional School District, Plainfield Community Consolidated School District, Purdue Polytechnic High Schools, Richland-Bean Blossom Community School Corporation, Richmond Community Schools, Rural Community Academy, Salem Community Schools, School City of East Chicago, School City of Hammond, School City of Mishawaka, Shelbyville Central Schools, South Adams Schools, South Bend Community School Corporation, South Central Community School Corporation, South Knox School Corporation, South Madison Community School Corporation, South Ripley Schools, Southwest Dubois School Corporation, Southwestern Jefferson County Consolidated School Corporation, Tell City - Troy Township Schools, Tippecanoe School Corporation, Tri-Central Community Schools, Tri-County School Corporation, Twin Lakes School Corporation, Union County School Corporation, Union Township School District, Valparaiso Community Schools, Warsaw Community Schools, Westfield Washington Schools, Yorktown Community Schools, and Zionsville Community Schools.

2021 DESIGN STEM Kids Conferences

CATALYST's spring DESIGN STEM Kids Conference was held virtually on May 13 and 14, 2021. The fall DESIGN STEM Kids Conference was held on November 18 and 19, 2021. With funding from General Motors, we partnered with Wabash Valley Education Center to provide opportunities for 5th-grade students to learn, explore, and engage in inquiry-/project-based STEM activities. In the spring, students participated in: *Put Me in the Zoo, Tall Tower Challenge, Robot Artist,* and *Secret Codes for Kids*. In the fall, students participated in *Robot Artist, Meet Your Meats, Gumdrop Atoms,* and *Wildlife Rehabilitation*. Purdue graduate student volunteers from the College of Education led these engaging, make-and-take STEM sessions during the two-day event.

In the spring, 31 teachers and 710 students participated from the following school districts:

- Benton Community School Corporation
- Carroll Consolidated School Corporation
- Clinton Central School Corporation
- Delphi Community School Corporation
- Eastern Howard School Corporation
- Logansport Community School Corporation
- MSD Warren County
- North Montgomery School Corporation
- Rensselaer Central Schools Corporation
- Sheridan Community Schools
- Tippecanoe School Corporation
- Tri-Central Community Schools
- Twin Lakes School Corporation

In the fall, 28 teachers and 678 students participated from the following school districts:

- Benton Community School Corporation
- Covington Community School Corporation
- MSD Warren County
- Rensselaer Central Schools Corporation
- Sheridan Community Schools
- Tipton Community School Corporation
- Twin Lakes School Corporation
- Union Township School District
- West Lafayette Community School Corporation

Characterizing How Teachers Design Engaging Learning Environments in STEM Education

Funded by the National Science Foundation ($325,009), *Characterizing How Teachers Design Engaging Learning Environments in STEM Education* is a Building Capacity in STEM Education Research Project. Dr. Paul Asunda, PI, will investigate teachers' conceptions of integrated STEM teaching and learning and how their conceptions influence the design of classroom experiences that engage students in these learning environments. Dr. Asunda will collaborate with five rural and diverse K-12 Indiana schools (16 teachers and 500+ students) designated as STEM teaching schools by the Indiana Department of Education. It is anticipated that the findings will identify critical methodological issues and theoretical links between integrated STEM instruction and learning environments that support student engagement for future research efforts, including teacher professional development opportunities in STEM education and student career choices in STEM fields.

Co-Developing a Curriculum Coherence Toolkit with Teachers (C3T2)

Co-Developing a Curriculum Coherence Toolkit with Teachers (C3T2) is an NSF-funded collaborative research project with mathematics education faculty and graduate and undergraduate students at Duquesne University, Michigan State University, and the University of Arizona. The research team, led by PI Dr. Jill Newton, seeks to understand how upper elementary teachers make decisions about their mathematics curriculum in the context of the limitless availability of online resources. In this study, the research team investigates how teachers use curriculum materials, think about curricular coherence, and how their decisions about curriculum lead to student learning. In Phase I of the project, they conducted a national survey of teachers to understand the range of curriculum contexts in which teachers are working and the decisions teachers make when they select and adapt curricular resources. Due to COVID, the nature of this survey changed dramatically from general curricular use to curricular use in the context of COVID. The survey has been analyzed, and findings disseminated in a range of venues, including conference presentations and journal publications (see sample publications below). The team is in the early stages of Phase II, in which they will be interviewing teachers in four different contexts about curricular use, coherence, and collegial collaboration.

Co-Robots to Enhance Motivation and Self-efficacy in Formal STEM Education

Dr. Nathan Mentzer and a team of colleagues recently launched the project, *Co-Robots to Enhance Motivation and Self-efficacy in Formal STEM Education*. Funded by the National Science Foundation, this project is a partnership between high school teachers in Indiana, the Purdue College of Engineering, and the Purdue Polytechnic Institute. Teachers collaborate with the Purdue team to learn ways of increasing and enhancing robotics instruction in high school schools, with the goal of attracting and sustaining underrepresented students' interest in STEM as well as developing awareness of STEM careers. Teachers will contribute to piloting, optimizing, and testing the efficacy of the robotics curriculum and associated robotics hardware. More than 20 teachers from Indiana and Georgia and over 1500 public-school students from diverse backgrounds will be reached. *Co-Robots to Enhance Motivation and Self-efficacy in Formal STEM Education* is broadening the participation of underrepresented students in engaging STEM learning experiences, including females and ethnic/racial minorities, by employing high-interest fields such as assistive and rehabilitation robotics, meaningful learning contexts such as improving human life, and hands-on learning facilitated with human-interactive robots. This project is funded in the amount of $746,412 from NSF's National Robotics Initiative 3.0: Innovations in Integration of Robotics program and the Innovative Technology Experiences for Students and Teachers (ITEST) program, which supports projects that build understandings of practices, program elements, contexts and processes contributing to increasing students' knowledge and interest in STEM.

Cultivating a National Collaborative for Research on Food, Energy, and Water Education

In this $749,964 NSF-funded grant, Dr. Hui Hui Wang (Co-PI), along with collaborators Cory Forbes (PI, University of Texas Arlington), Nicole Sintov (Co-PI, The Ohio State University), and Hannah Scherer (Co-PI, Virginia Tech), will cultivate a new, transdisciplinary community, the National Collaborative for Research on Food, Energy, and Water Education (NC-FEW). NC-FEW is a hub of innovation for education research on FEW-Nexus educational programs at many levels (K-12, postsecondary, adults) and settings (formal and informal). The project will directly impact an estimated 600 educators and education researchers (postsecondary faculty, K-12 teachers, informal educators) from diverse institutions, as well as a variety of learners in an array of educational settings. This Research Coordination Network (RCN) will enhance educational programs grounded in the FEW-Nexus. The RCN will benefit society by improving STEM/FANH science literacy through educational innovation and capacity building around an important sustainability challenge.

Development and Assessment of an Online Fatigue Training Program

Dr. Paul Asunda (Co-PI), in collaboration with a team of professors in Purdue's School of Aviation and Transportation Technology and Embry Riddle Aeronautical University in Florida, is developing curriculum training materials based on findings from research focused on mitigating fatigue in professional flight students. The curriculum consists of three modules, (a) causes and symptoms of fatigue, (b) best practices for sleep and a healthy lifestyle, and (c) decision-making related to what student pilots may face today and what they may face in the future workplace. It is anticipated that this fatigue training program will change behaviors in over 1000 students at Purdue University. In addition, it will help student pilots develop healthy lifestyle habits and decision-making skills as they become safer student pilots not only at Purdue University but also across the broader aviation community. This project is funded by a $12,000 seed grant through the PPI.

Engineering by Design Workshops

CATALYST is in its second year of offering *Engineering by Design* workshops for Purdue undergraduate elementary education majors. *Engineering by Design* (EbD) is a program developed by the International Technology and Engineering Education Association. Led by Dr. Nathan Mentzer, workshop participants engage in project-based, inquiry-based integrated STEM instruction while learning how to teach lessons from the EbD curriculum, which is based on the Standards for *Technological and Engineering Literacy*, as well as national standards for science and math and the NAE's Grand Challenges for Engineering. Workshop completers received a Technology, Engineering, Environment, Mathematics and ScienceTEEMS certificate, a complimentary subscription to Technology and Engineering Teacher, ITEEA's flagship publication, and one-year access to the entire EbD curriculum. To date, ten students have completed the workshop and are classroom-ready to implement integrated STEM lessons.

Expanding Accessibility of Learning through Blended Synchronous Instruction of F2F and Remote Students

Expanding Accessibility of Learning through Blended Synchronous Instruction of F2F and Remote Students is a 3-year, $599,980 grant funded by the National Science Foundation. The goals of the project are to (1) develop, test, and use teaching practices and curricular innovations that will engage students and improve learning, persistence, and retention in STEM, and (2) implement and sustain highly effective STEM teaching and learning in colleges and universities. The project team, led by Dr. Nathan Mentzer, will examine active learning strategies in blended synchronous instructional environments to further define HyFlex as an educational model, optimize the approach, and study the efficacy of student learning and sense of community. This project will annually impact at least 1,500 and 10 graduate students during the project period but have a growing and lasting impact long after the project has ended.

Feed the Future Innovation Lab for Food Safety

Dr. Hui Hui Wang (Co-PI) is a member of a Purdue University—Cornell University collaboration of scientists developing programs to improve food safety in Bangladesh, Kenya, Ethiopia, Senegal, and Cambodia. This project is funded by a $ 9,989,774 grant from the U.S. Agency for International Development (USAID) to establish what is said to be the first-ever Feed the Future Innovation Lab for Food Safety.

GEMS: Girls Excelling in Math and Science

GEMS (Girls Excelling in Math and Science) clubs were started in 1994 to encourage students, especially girls, to pursue education and careers in STEM fields, particularly technology, engineering, and related high-paying, entrepreneurial enterprises. GEMS clubs strive to ensure that children see themselves as change agents or problem-solvers, possible technology entrepreneurs, engineers or scientists, and people who make a difference. Led by Drs. Jill Newton, Elizabeth Suazo-Flores, Signe Kastberg, Rachael Kenney, Laura Bofferding, and Laura Jones, GEMS came to Purdue and CATALYST in 2018, and we are currently building capacity for growing the GEMS club network both in Indiana and around the world.

Indianapolis STEM Teacher Residency

This $5.1 million project, funded by the U.S. Department of Education, is a collaborative partnership between Indianapolis Public Schools (IPS) and Purdue University and is led by Drs. Lynn Bryan (PI) and Selcen Guzey (Co-PI). The overall vision of *Indianapolis STEM Teacher Residency* (ISTR) is to strengthen the educational outcomes of students in the largest urban school district in Indiana, IPS, by preparing culturally competent, highly qualified career STEM teachers who will elevate student achievement in middle and high school science (including computer science), technology, engineering, and mathematics. The ISTR program is designed for prospective science and mathematics teachers with a bachelor's degree in a STEM-related field. ISTR participants will complete an Interdisciplinary Master of Science degree in Secondary STEM Education with Initial Licensure and the K-12 Integrated STEM Graduate Degree Certificate within 18 months. Participants complete an academic year-long residency in an IPS school as part of the Interdisciplinary Master of Science degree in Secondary STEM Education with Initial Licensure. Immediately after completing state licensure requirements and university coursework, ISTR teachers will be employed full-time in IPS. The 2021 cohort consists of 6 prospective teachers. Partnering schools in IPS include Arsenal Tech High School, Longfellow Middle School, and George Washington High School.

Industry-Driven Integrated STEM and Systems Approach to Innovative Incubation

Industry-Driven Integrated STEM and Systems Approach to Innovative Incubation is a U.S. Department of Agriculture/National Institute of Food and Agriculture grant (2020-2024) in which Purdue scientists from the College of Agriculture co-develop agriculture and iSTEM educational materials that are solidly grounded in agro-ecosystem thinking. This project aims to increase rural high school teachers' agriculture and STEM literacy teaching capacity and equip high school students' system thinking and data-based decision-making skills by solving industry-based, real-world agricultural design challenges from pre-harvest to post-harvest themes. Dr. Hui Hui Wang is the PI, and Drs. Neil Knobloch, Roger Tormoehlen, Betty Feng, and Peter Langenhoven are Co-PIs for this $300,000 grant project. Partnering high schools include LaPorte High School, Portage High School, Purdue Polytechnic High School Englewood, Purdue Polytechnic High School North Campus, Riley High School, Tri-County High School, and West Washington High School

Integration of Engineering Design and Life Science: Investigating the Influence of an Intervention on Student Interest and Motivation in STEM Fields

Integration of Engineering Design and Life Science: Investigating the Influence of an Intervention on Student Interest and Motivation in STEM Fields (aka PULSE) is a $1.8 million project funded by the National Science Foundation that involves research, teaching, and engagement. The PULSE team is investigating middle school students' learning of and interest in Life STEM due to engaging in instruction that integrates science and engineering design. Specifically, we are conducting a large-scale, longitudinal field study to develop research-based understandings of how to support student learning and interest development among middle school students from underrepresented backgrounds. We are developing content-rich, engineering-design based curriculum units that focus on core life science ideas and practices identified in NGSS (the NGSS Lead States, 2013); providing sustained-contact professional development to allow middle school science teachers to meaningfully integrate engineering in their life science classes; and supporting teachers as they implement the project constructed teaching materials. Purdue faculty and staff involved include Drs. Selcen Guzey (PI), Lynn Bryan (Co-PI), Muhsin Menekse (Co-PI), and Bill Walker.

PULSE involved 35 middle school teachers reaching more than 5500 students over the lifetime of the project. The following schools are project partners: Battle Ground Middle School, East Tippecanoe Middle School, Klondike Middle School, Wainwright Middle School, Wea Ridge Middle School, Southwestern Middle School, Highland Middle School (Anderson Community Schools), Frankfort Middle School, Rossville Junior High School, Carroll Junior High School, Delphi Middle School. Teachers participate in a 2-week online course and a one-week (40 hours) face-to-face course at Purdue University each summer. In addition, teachers participate in 15+ hours of professional development in the academic year as a professional learning community. In 2021, we expanded the project to include a new program: Inclusive Science Education Professional Development Program: Developed and delivered a year-long, online PD for 11 science teachers from local school districts to help them increase their understanding of and practices of equity-focused, asset-based science teaching.

Learning by Evaluating: Engaging Students in Evaluation as a Pedagogical Strategy to Improve Design Thinking

Learning by Evaluating: Engaging Students in Evaluation as a Pedagogical Strategy to Improve Design Thinking is a 3-year, $1.26 million grant funded by the National Science Foundation. The goals of the project are to develop, refine, and test an educational innovation in which 9th-grade students evaluate sample work as a starting point in engineering design cycles. The project will work directly with DeKalb County School District in Atlanta, Georgia, and connect to an internationally implemented 9th-grade course offered through the International Technology and Engineering Educators Association STEM Center. The pedagogical strategies emerging from this project could be embedded in other STEM Center courses offered in K-12 classrooms internationally or incorporated by individual teachers in various disciplines through the dissemination of freely available instructional resources. The project team, led by Dr. Nathan Mentzer (PI), combines design education researchers from Purdue, Brigham Young, and the University of Georgia, the director of the International Technology and Engineering Education Association's STEM Center, and the Career Technical and Agricultural Education Instructional Coordinator for the DeKalb County School District. The project engages ten teachers in Georgia. Project outcomes include the development of a research-based curriculum and approximately 500 students this year and will increase to about 1000 in the next few years.

Math Recovery Project

Dr. Bill Walker (co-PI), Assistant Director of Programs and Partnerships at CATALYST, and Dr. David Feikes (PI), Professor at Purdue University Northwest, were awarded two grants from the Indiana Department of Education ($140,000, $173,000) for the *Math Recovery Project*. The *Math Recovery Project* provides teachers one week of professional development with activities and materials that promote math recovery for high-needs students. The project includes approaches focusing on significant mathematical tasks, social and emotional learning, small-group work and whole-class discussion, and students becoming autonomous learners. The Math Recovery Project started in summer 2021 with seven workshops for 58 teachers who worked with over 1,100 students. Additional workshops are planned for summer 2022 and summer 2023.

Purdue Polytechnic High School (PPHS) Collaborative Research Grant

In partnership with Purdue Polytechnic High School, Dr. Hui Hui Wang (PI) and co-PIs Neil Knobloch, Roger Tormoehlen, Betty Feng, and Petrus Langenhoven are leading this project (2019-2022, $20,000) that combines developing problem-solving skills and entrepreneurial thinking through Incubation Design Challenges (IDCs) in high school classrooms.

Sensing Science through Modeling Matter

Sensing Science through Modeling Matter (S2M2) is a $2.6 million National Science Foundation-funded research grant with an engagement component. Drs. Lynn Bryan and Ala Samarapungavan collaborated with Concord Consortium to develop and research an inquiry-based, modeling-based curriculum to support early science kindergarten learning of concepts involving matter and its changes. In 2021, we devoted effort to disseminating scholarship related to this project that involved four kindergarten teachers from Hershey Elementary, two kindergarten teachers from Oakland Elementary, and four kindergarten teachers from Chelmsford, Massachusetts.

WHIN with Local STEM

WHIN with Local STEM is a $ 65,649 project (2019-2022) led by Dr. Hui Hui Wang, with co-PIs Drs. Neil Knobloch, Roger Tormoehlen, Betty Feng, and Petrus Langenhoven developed a data-based integrated STEM learning experience with high school teachers/students. *WHIN with Local STEM* partnering schools include Benton Central High School, Frontier High School, and Tri-County High School.

James Ackerman Center for Democratic Citizenship

- Purdue University's Constitution Day Celebration, 2005 – present. Professor VanFossen was invited to coordinate the event by the President's Office. Event involves 100s of Purdue students and faculty annually. The Celebrity Quiz-Off returned to in-person and had as participants state representatives, mayors, judges, Purdue student-athletes, as well as key Purdue administrators (Dean of Students, etc.). The center developed additional Constitution Day curriculum and Kahoot! Quizzes that teachers and students could access to conduct their own Constitution Day celebrations. In addition to the array of booths, the Center also highlighted the Center YouTube video we created last year (introduced by Pres. Mitch Daniels) of local celebrities reading the Preamble and the Bill of Rights (most popular video on COE YouTube channel over the last 2 years with more than 1,900 views).

- Co-founder and co-coordinator of the Purdue Series on Corporate Citizenship and Ethics. The Series, co-sponsored with Krannert School of Management, has hosted 30 speakers. Series speaker John Carryrou (WSJ investigative journalist author of Bad Blood; the Elizabeth Homes/Theranos story) spoke before nearly 200 attendees on April 16, 2021.

- Purdue University's Holocaust Remembrance Educator Workshop. Sessions for students have included Holocaust survivors, presentations by notable children's authors such as and Lois Lowry (Number the Stars), plays and art displays. The 2021 workshop offered

teachers a “Spotlight on Contemporary Antisemitism” and was co-presented by Echoes and Reflections. More than 40 teachers attended the Zoom sessions

- The Greater Lafayette Holocaust Remembrance Committee (GLHRC) received the “Never Again Ambassador Award” at the Indianapolis Capitol on November 9, 2021. For over 25 years, the Ackerman Center for Democratic Citizenship has supported the GLHRC because of the importance of continuing to teach the history of the Holocaust and associated topics in our classrooms. The Indianapolis Jewish Relations Council and the Indiana Civil Rights Commission jointly presented the honor for GLHRC’s 40 years of work to “create meaningful spaces for both the memories and lessons of the Holocaust to never be forgotten, so that such atrocities never happen again.”

- Project Citizen. Civic education outreach project. Students address local public policy problem, research solutions, and make presentation before a panel of judges. High profile members of the local community have served as judges (e.g., state reps., mayors, local judges, etc.). Ackerman Center has sponsored two local showcases annually since 2009. The Project Citizen Showcase is a graduation requirement for Oakland High School in LSC. Due to COVID, 2021 Showcases took place via Zoom.

- LUM Citizenship Classes: Ackerman Center developed curriculum guides and donated teachers manuals, world maps, and 50 textbooks to the LUM Citizenship Classes. The class assists future citizens in preparing to take the naturalization test. The research-based methods promote greater comprehension and retention of the course material. This work through the Ackerman Center enabled LUM to qualify for a USCIS Citizenship & Assimilation Grant. The Ackerman Center has supported four 5-week classes to this point. To date, four former students have successfully achieved U.S. citizenship! 2021 classes were cancelled due to COVID.

- Professional Development Series for K12 Educators. The Center provides multiple formats of professional development including an evening series during the school year. The goal of our programming is to support elementary and secondary teachers to develop classroom-ready instructional strategies and activities focused on the skills and dispositions associated with citizenship. The 2020-21 series was canceled due to COVID-19.

GK-12: Graduate Engagement in K-12

Anatoli Rapoport, Faculty in Social Studies Education. The GK-12: Graduate Engagement in K-12 program started in 2006. The program gives masters, doctoral, and post-doctoral students a mentored, in-depth opportunity to share their research with K-12 students and teachers in local schools. It provides participants with enhanced skills and experience in outreach, teaching, and communication of their research with diverse audiences. Regular annual surveys demonstrate that program alumni believe they are more competitive for academic and professional jobs due to the knowledge and skills obtained during the program.

Initially, the program was funded by a NSF grant (2006-2008). Since 2009, the program is supported by Graduate School through Bisland Strategic Initiative Fellowship that provided funding for a Graduate Assistant who organizes and coordinates the program on a daily basis. Unfortunately, Graduate School stopped supporting the program in 2019.

GK-12 is one of the most sustainable graduate programs on campus. For 14 years since its inception, almost 300 graduate and post-doctoral students participated in the program. After a slight decline in 2009-2010, the enrollment steadily goes up. 23 masters and doctoral students participate in 2018-19 GK-12 program and 18 – in 2019-2020. The program partnered with 4 local schools: Wea Ridge Elementary, Tecumseh Middle, Harrison High, and McCutcheon High. Tecumseh Middle School is the principal partner of the program. More than 40 Tecumseh teachers have mentored GK-12 participants since 2006, supervising their work in classrooms. The estimated number of elementary, middle and high school students impacted by the program is about 6,000. All program participants apply and receive service learning grants that range from $500 to $1,500 each.

A primary purpose of the program is to translate participants' pedagogical experiences into research and to facilitate the development of a research agenda in education related to program participants' expertise. Since 2011, participants have presented individual and group research at Annual Graduate Student Education Research Symposium (AGSERS). Program participants made presentations at regional and national conferences. 7 articles in peer-reviewed journals were published based on research conducted during GK-12.

The program has recently started to establish and develop international relations. Program international partners are:

- Doktorander I Lärander/ DiL (Doctoral Students and Learning) in Angelholm commune +Lunt University (Sweden)
- Preparation Program in ITMO University (St. Petersburg, Russia)
- Katolische Universität Leuven (Belgium)

Despite a short interruption in Fall 2020 caused by the pandemic, GK-12 successfully resumed in Spring 2021. In 2021-2022 school year, 13 Purdue masters' and doctoral students received GK-12 Certificates of completion.

University & Community Engagement

- **Animal Advocates of Greater Lafayette**; Professor Nadine Dolby's engagement is focused on community engagement. She started a community-based education organization, that focused on companion animal education, humane education, and the human/animal bond. Animal Advocates of Greater Lafayette distributed over 40,000 lbs. of pet food to needy families in our community during the pandemic and has continued virtual classes through Food Finders Food Bank. Professor Dolby was a recipient of a Jefferson Award for Public Service for her work as founder and president of Animal Advocates of Greater Lafayette. As detailed above, Animal Advocates of Greater Lafayette continues its work focusing on education, service, advocacy, and outreach to serve people and pets in the Greater Lafayette community. In 2021, the organization collaborated with more than 20

organizations, businesses, government entities, and Purdue units in support of our mission to keep pets out of shelters, keep families together, and celebrate and educate about the human-animal bond.

- **Clifford B. Kinley Trust.** (2021) $20,000: Evaluating the methods and effectiveness of community-based organizations in supporting economically marginalized students and students of color through college. Dr. Case and her team added another partner to their Kinley-funded project exploring parents' experiences of community-based college success programs.
- **CILMAR** (Center for Intercultural Learning, Mentorship, Assessment and Research) In Spring 2021, Dr. Aletha Stahl at CILMAR and Dr. Wanju Huang collaborated through an IES grant proposal and the worldview certificate program at Purdue expressed the need for instructional design support to enhance the intercultural learning modules that her department developed. In Fall 2021, a service-learning project in EDCI 57200: Learning System Design was implemented. Students redesigned three out of six available intercultural learning modules including: 1) understand assents different than yours; 2) intercultural collaboration; and 3) critical reflection. Those topics were chosen with thorough assessments from the students and in-depth discussions with Dr. Stahl. Based on the data provided by Dr. Stahl, approximately 5,300 undergraduate students at Purdue completed CILMAR's intercultural learning modules in Spring 2021 and Fall 2021. Students can now contribute to Purdue's intercultural learning program through the service-learning project. The influence of their instructional design on Purdue students will continue to grow as more and more instructors are integrating intercultural learning content in their courses.
- **Downtown Boxing Gym** (2021): The work Dr. Amada Case conducted in 2021 included continuing to implement a year-round evaluation schedule, finishing a pilot project of their embedded STEAM lab, consulting on the development of their alumni surveys, sitting in on meetings with two different potential partners, and presenting to the Board of Directors.
- **Gabriel's Light (2021):** Development, Implementation, and Testing of a Mental Health Consultation Model for Summer Camp Counselors. In 2019 YMCA Camp Tecumseh solicited assistance designing a mental health support program for their summer camp counselors. In partnership with Tecumseh and alongside Purdue counseling psychology doctoral students, Dr. Amanda Case designed a mental health consultation model that was implemented and tested for a second time in Summer 2021. Counseling Psychology doctoral students not only served as the consultants in the 2021 implementation (enrolling in a summer course with me) but were also involved throughout all discussions about program evaluation and refinement.
- **Purdue Series on Corporate Citizenship and Ethics.** Professor VanFossen is the co-founder and co-coordinator of the series, co-sponsored with Krannert School of Management, which has hosted 32 speakers—including author Michael Lewis, Nobel Prize winner Lech Walesa, film-maker Ken Burns, Wikipedia cofounder Jimmy Wales, former Attorney General Richard Thornburgh, Sears CEO Arthur Martinez, and Jerry Greenfield of Ben and Jerry's—with combined attendance of over 20,000. Annual support from PFCU.
  See: https://www.education.purdue.edu/ackermancenter/programs/lecture-series/

- Downtown Boxing Gym (DBG) (2021): Professor Amanda Case partnered with DBG. Since 2013 Dr. Case has been collaborating with DBG, serving as a program evaluator and consultant to support their youth development programming. The work conducted in 2020 included creating and implementing a year-round evaluation schedule, conducting a pilot project of their embedded STEAM lab, consulting on the development of their college success programming, and sitting in on meeting with potential funders to assist in describing DBG's evaluation plans.
- PoRTAL is the current centerpiece for Purdue's Innovative Learning initiative, which aims to leverage Purdue's teaching, learning and educational resources across campuses to offer creative and innovate solutions to meet the current and future needs of the university. Professor Jennifer Richardson leads the cross-campus collaboration PoRTAL project. See: https://www.purdue.edu/innovativelearning/supporting-instruction/portal/
- Purdue University Faculty Athletic Representative (FAR). Professor Philip VanFossen was Appointed by President Daniels to a 2nd three-year term (2020-2023) As one of two FARs for Purdue, VanFossen serves in an oversight and advisory capacity between the faculty and the department of athletics. FARs ensure that athletics operates within the overall mission of Purdue University, and we represent the university in dealings with the NCAA and the Big Ten. Phillip regularly interact with President Daniels—meeting a minimum of 3 times per year.
- Scholarship of Engagement Fellows Program (2021): Increasing accessibility of Imagination Station. In response to a specific request from staff at the Imagination Station, this project was intended to increase the accessibility and inclusivity of Imagination Station, a local Science Center, to more economically marginalized families in the Greater Lafayette area and beyond. This project is underway as part of my 2021-2022 Scholarship of Engagement Fellows Program. Imagination Station is a community science center located in Lafayette, IN. Starting in Fall 2021 Dr. Amanda Case, along with other Imagination Station staff and volunteers, met three times to begin developing a research plan.
- Substance Abuse and Mental Health Services Administration (SAMSHA) Dr. Wanju Huang is one of the Co-PIs for the SAMSHA project, funded by the U.S. Department of Health and Human Sciences, SAMHSA Grant. I led the instructional design team to collaborate with five Purdue nursing faculty members to develop a MOOC (Massive Open Online Course) titled "Nurses' Substance Use Education." This MOOC was implemented in both Brightspace and Canvas to increase its adaptivity in other institutions. It became available to the public in Summer 2021. Since then, it has been implemented in several Purdue undergraduate and graduate nursing courses. Other universities such as University of Southern Indiana have been in touch with the team expressing interest in implementing the learning modules in their courses. This project has been recognized and showcased by the Addiction Technology Transfer Center Network (ATTC), an international, multidisciplinary resource for professionals in the addiction's treatment and recovery services field. With this recognition, the team believes more faculty and health care providers will be incorporated these learning modules in their curriculum to

prepare a professional nursing workforce that is ready to provide informed substance-use care for their patients.

2021 Faculty /Staff Engagement Awards and Recognition

These awards were presented for the 2020-2021 academic year

University Awards

Christian J. Foster Award – Selcen Guzey

College Awards

Earl B. Notestine Award – Sean McCan

Outstanding Faculty Engagement College Award – Amanda Case

Department Awards

Faculty Engagement Scholar Award -- Laura Bofferding

Professional Awards

Scholarship of Engagement Fellowship -- Kristen Seward

Engagement Funding Sources

Characterizing How Teachers Design Engaging Learning Environments in STEM Education: Examining Teachers' and Students' Conceptualizations of Integrated STEM (7/2021-6/2023); $325,009 National Science Foundation: Building Capacity in STEM Education Research (BCSER) (PI: Paul Asunda)

Expanding accessibility of learning through blended synchronous instruction of F2F and remote students. National Science Foundation, IUSE: EHR. (07/01/2021- 6/30/2024); $600,000 / $25,662 (PI: Nathan Mentzer)

Department of Education, Indy STEM Teacher Residency and Indiana Commission for Higher Education, Strengthening Indiana's Future through the 21st Century STEM Teachers Scholarship Program $5,177,290 and $255,000 (PI: Lynn Bryan)

Innovation in Quantum Pedagogy, Application and its Relation to Culture (IQ-PARC) (9/2021-8/2024); $2,815,000 U.S. Department of Defense (PI: Muhsin Menekse)

Interprofessional Education Supporting the High Intensity Needs of Exceptional Students (IPE-SHINES) (11/2021-10/2026); $1,135,870 U.S. Department of Education: Office of Special Education Programs (PI: Rose Mason)

Mentoring, Consultation, Coordination (Jan-Dec 2021); $10,000 PRF and BACI (Co-PI: Xiang Zhou)

Parental Inclusion in Language and Research (Project PILAR) (7/2021-6/2026); $2,903,764 U.S. Department of Education: National Professional Development (PI: Trish Morita-Mullaney)

U.S. Department of Education's Office of English Language Acquisition (2017-2022); $1,892,481. Project PUEDE, Responsibility: 80% (details under PI Morita-Mullaney in P-12 Schools section)

U.S. Department of Education's Office of English Language Acquisition (2017-2022); $1,840,319. Leveraging the Lectura y Lenguaje. Responsibility: 80% (details under PI Morita-Mullaney in P-12 Schools section)

US Dept. of State (2022-2024); $750,000 (Rapport) Benjamin Franklin Transatlantic Fellowship, An annual international program for 55 students from all European countries and the United States.

Scholarship of Engagement

Publications

Walker, W. S., Bryan, L. A., Guzey, S., S., & Suzao-Flores, E. (Eds.) (2021). Proceedings of the annual Indiana STEM Education Conference, January 14, West Lafayette: Purdue University. https://docs.lib.purdue.edu/instemed/2021/

Wright, B., Azmat, A., Aggarwal, A., Sieplinga, J., Radding, M., Case, A. S., & Khalil, A. (2021). Using Participatory Culture-Specific Consultation to Support the Mental Health Needs of Summer Camp Staff. Journal of Community Psychology.

Presentations

Bryan, L. (2021, December). K-12 Integrated STEM Education: Perspectives and Considerations. Invited keynote address for the Association of Science Education Taiwan (ASET), Taiwan. (virtual)

Bryan, L. (2021, June). Underestimated capabilities and underemphasized science practices: Teaching young children core ideas in physical science through discourse-rich, modeling-based science instruction. Invited keynote address for the International Conference on Science Education, Singapore. (virtual)

Case, A. S., & Hauser, J. (2021, April). What it Takes to Make University/Community Organization Partnerships Work. Spark session presented at the 2021 National Partnership of Educational Access Conference, Virtual.

Case, A. S., Hauser, J., Bhojwani, J.1, Fanok, S., & Krutsch, J. (2021, February) Invisible first responders: How community-based educational spaces are combatting the dual pandemics of systemic racism and COVID-19. Symposium presented at the 2021 Winter Roundtable, Virtual.

Case, A. S., Bhojwani, J., Maldonado, S., & Hoxsey, A. (2021, April). Supporting college success for economically marginalized students through community programming. Symposium presented at the 2021 American Education Research Association National Convention, Virtual.

Case, A. S., Hauser, J., Bhojwani, J., Fanok, S., & Krutsch, J. (2021, February) Invisible first responders: How community-based educational spaces are combatting the dual pandemics of systemic racism and COVID-19. Symposium presented at the 2021 Winter Roundtable, Virtual.

Cin, Z., Hmun, L., Lang, F., Lian, V., Thang, B., Thang, S., Then, Z., Novak, D.UG, Par, M UG, & Zhou, X. (2021, August). Political Participation & Civic Engagement among Burmese American young adults. Research presented at the 10th Annual Burmese American Community Institute Conference.

Huang, W. (2021) Building a learning community and institutional presence with video feedback. Presentation at the Teaching and Learning Technologies Workshop.

Kung A., Nung, J., Par, T. T., Par, T., Sung, T. P., Tial, C., Chha, V., Shein, B., & Zhou, X. (2021, August) College persistence among Burmese American university students. Research presented at the 10th Annual Burmese American Community Institute Conference. [D]

Lowell, Victoria L., (2021), Presentation on Authentic learning and fidelity in virtual reality learning experiences for self-efficacy and transfer, with graduate student, Deepti Tagare, for the Career and Technical Education Seminar Series, Purdue University.

Lowell, Victoria L., (2021), Presentation on Developing your literature review to the Purdue Technology in Education Program's TECH 621 Seminar.

Lowell, Victoria L., (2021), Presentation on Authentic learning and fidelity in virtual reality learning experiences for self-efficacy and transfer, on December 3, 2021,with graduate student, Deepti Tagare, for the Career and Technical Education Seminar Series, Purdue University.

Morita-Mullaney, T. (2021). Intersecting Identity and Advocacy into Research and Praxis. Paper presented in Seminar on Literacy with Dr. Christy Wessel Powell. Purdue University, West Lafayette, IN.

Morita-Mullaney, T. (2021). Case Studies in Qualitative Research with Dr. Toni Rogat. Invited session for Undergraduate Research Training course. Purdue University, West Lafayette, IN.

Richardson, J.C. (2021). Keynote speaker: Indiana STEM Education Conference 2021. Purdue University.

Trieu, M., Bonini, R., Villaver, M., Morita-Mullaney, T. & Sari, P. (2021) How Did We Get Here? Teach-In: Q & A with Asian American Scholars on Anti-Asian Racism. Invited session by the Purdue Asian American and Asian Resource Center. Purdue University, West Lafayette, IN.

Ongoing Projects

Guzey, Selcen S., Advisory board member: NSF, DRK-12, Computational Thinking in High School Biology (2021- 2025). Project PI is Dr. Ido Davidesco from University of Connecticut.

Kastberg, Signe E., Editor of the special issue of the journal, Philosophy in Mathematics Education focused on Philosophy underpinning Self-Based Methodologies in Mathematics Teacher Education journal. (2021), This work will include stories, narrative inquiry, autoethnographies, and self-studies accompanied by interviews of authors to unpack the philosophy that supports their work and authenticities that lead to trustworthiness as described by Lincoln (1995, p. 277).