



College of Education

COLLEGE OF EDUCATION ENGAGEMENT REPORT 2023

Figure 1 College of Education Engagement Report

FOREWORD

Engagement is absolutely central to the mission of the College of Education. What's more, engagement is essential to fulfilling Purdue's larger Land Grant Mission. This engagement takes many forms and impacts many stakeholders: P-12 educators and students, education leaders, parents and families, and educational researchers. Speaking of research, much of the scholarly work of our faculty occurs in—or directly studies--P-12 schools and students. Examples of this work include: (1) the \$2 million, five-year grant from the National Science Foundation to study the long-term impacts of the Downtown Boxing Gym's (Detroit) after-school STEM learning program, (2) the research that led to creating innovative Extended Reality (XR) and Augmented Reality (AR) instructional materials and resources to help teachers enhance student learning and engagement, (3) the Indy STEM Teacher Residency program--funded by a \$5 million federal grant--designed to prepare secondary STEM teachers for work in Indianapolis Public Schools, and (4) the launching of the Purdue Center for Rural Research, Education, and Outreach—believed to be the only center of its kind in Indiana. These are but a few notable examples of how essential engagement is to the success of the College.

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 acknowledgment shall be used by faculty, staff, and students at their discretion.

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INTERIM DEAN & J.F. ACKERMAN PROFESSOR,

COLLEGE OF EDUCATION

PURDUE UNIVERSITY

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COLLEGE OF EDUCATION ENGAGEMENT REPORT 2023 YEAR



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COLLEGE OF EDUCATION ENGAGEMENT REPORT – 2023 YEAR

Purdue University's College of Education is dedicated to advancing the future by exploring and nurturing human potential. Our commitment is evident in the impactful trio of educational research, scholarship, and teacher preparation, all working together to bring about positive change and enhance the lives of learners across various age groups and abilities in both formal and informal educational settings. Over an impressive period of nearly 110 years, we have seen the realization of this visionary commitment. Despite significant achievements, there is still ample room for ongoing progress. Looking forward optimistically, our Strategic Plan for 2021-2026 outlines a mission, vision, and strategic goals that align with our dedication to engagement. As we move forward, we are confident that our collective efforts will pave the way for a future where education remains a catalyst for positive transformation and enduring impact.

The mission of the College of Education at Purdue University is: Moving. Together.

We advance inclusive and sustainable learning communities through high impact scholarship, inspirational teaching, vision-driven service, and collaborative community engagement.

The vision of the College of Education at Purdue University is: Launching Giant Leaps Together.

The College of Education at Purdue University is a national leader in modeling inclusive excellence and nurturing sustainable educational practices and systems for a just society and better world; the scholarship of discovery, learning, and engagement; and the development of human potential.

Strategic Goals for 2021-2026 are:

Goal 1: Implement teacher education innovation as a means of improving sustainable practices in education that impact the world around us.

Goal 2: Increase student enrollment and retention with recruiting emphasis on historically underrepresented groups.

Goal 3: Promote positive climate practices that value and showcase work in support of inclusive excellence.

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.

In the Spring of 2023, the Teacher Education program hosted the second Rural Education Summit. This gathering of rural school administrators, teachers, and stakeholders examined the challenges and opportunities facing the schools and communities in underfunded rural areas. The summit presented directly applicable research and practices to address the needs of English learners, gifted populations, and the teacher shortage pipeline. The college received approval from the Office of the Provost to establish the Purdue University Center for Rural Research, Education and Outreach. The mission of the center is to ensure rural collaborative partnerships that promote

high quality experiences for teachers and students; coordinate education outreach efforts; and provide sustainable opportunities for advancing the needs of communities through interdisciplinary research and advocacy.

In the Fall of 2023, the College launched a School Partner Liaison Pilot with Lafayette School Corporation. In this program, a key teacher partner was identified from each school to maintain a collaborative partnership to facilitate engagement and support between classroom teachers, Purdue candidates, and the university. The liaisons offer support to in-school teachers and Purdue candidates by providing guidance, resource, and assistance as needed.

The Susan Nierstheimer Memorial Book Fund: During the 2022-23 fiscal year, the Susan Nierstheimer Memorial Book Fund was able to deliver 1,141 books to 163 students from six different local schools. Since 2006, the Susan Nierstheimer *Memorial Book Fund* has gifted over 14,000 books to nearly 3,100 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's chosen titles were:

- *Pass the Ball Mo* by David Adler
- *Chrysanthemum* by Kevin Henkes
- *The Big Red Barn* by Alyssa Margaret Wise Brown
- *Inch by Inch* by Leo Lionni
- *One Windy Day* by Tammi Salzano
- *Biscuit Goes to School* by Alyssa Satin Capucilli
- *Bunny Will Not Smile* by Jason Tharp

As always, the books were 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."

Faculty Engagement

Asunda, Paul, Faculty in Engineering and Technology Teacher Education

NSF (2022 - 2025), \$199,996: Research Initiation: Developing Spatial Visualization and Understanding of Complex Systems via Interactive Mixed Reality Modules: The Professional Formation of Engineers: Research Initiation in Engineering Formation (PFE: RIEF): Dr. Paul

Asunda, is a coPi as well as mentoring (Dr. Farid Breidi -PI) on this project. Spatial visualization is the ability to mentally maneuver two- and three-dimensional objects, and thus is an essential skill for engineering technology students. Research shows that students with poor spatial-visual skills feel discouraged because they cannot complete tasks that seem easy to their colleagues. Consequently, the lack of spatial visualization skills may negatively impact students' performance. This research demonstrates a digitized-based technique to develop spatial visualization in engineering technology students. The research will examine the efficacy of integrating state-of-the-art MR technology into advanced engineering technology courses. Interactive MR modules will be employed as a pedagogical tool to study and enhance students' visualization skills. The proposed research will have a broader influence that benefits society in different aspects, including (1) developing spatial visualization skills that are needed in everyday life situations, (2) advancing the infrastructure of STEM instruction and research, and (3) progressing discovery and promoting learning through the implementation of interactive visual representations.

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

U.S. Department of Education (2023) \$5,177,290: The Indianapolis STEM Teacher Residency (ISTR) Program is a collaborative partnership between Indianapolis Schools (IPS) and Purdue University, led by Drs. Lynn Bryan (PI) and Selcen Guzey (Co-PI). The overall vision of the ISTR Program 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, computer science, technology, engineering, and mathematics. ISTR participants 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 also complete an academic year-long residency in an IPS school. Immediately after completing residency, state licensure requirements, and university coursework, ISTR teachers are employed full-time in IPS.

General Motors (2023) \$10,000: With funding from General Motors, we partnered with Wabash Valley Education Center to provide opportunities for 4th and 5th-grade students to learn, explore, and engage in inquiry-/project-based STEM activities. Students participated in Clean Cut and Let There Be Light in spring 2023 and Robot Artist and Tower Crane in fall 2023. Purdue graduate student volunteers from the College of Education led these engaging, designSTEM sessions.

Case, Amanda, Faculty in Counseling Psychology

U.S. Agency for International Development. (4/1/21-7/31/23). \$1,061,309. Dr. Case role: Technical Advisor (\$15,000) Pambas, T., Raman, A., & Yih, Y. R. Tanzania Early Grade Social and Emotional Skills and Phonics-Based Literacy Learning Agenda, Long-term Assistance and Services for Research (LASER) Partners for University-Led Solutions Engine (PULSE), PRIME AGREEMENT NO. AID-7200AA18CA00009.

Exter, Marisa, Associate Professor of Learning Design and Technology, Curriculum & Instruction

National Science Foundation (2021-2024) app. \$3,100,000: "Collaborative Research: IUSE: A Data-Driven Employer-Academia Partnership for Continual Computing Curricular Change." This multi-institutional grant includes PIs from Purdue University, as well as George Washington University, Rochester Institute of Technology, Tuskegee University, University of Alabama, University of Illinois, and University of New Hampshire. Dr. Exter is the Purdue PI. She was initially responsible for \$527,620 to fund work done at Purdue. In December 2022, she received \$104,995 in additional funding to assist in the creation of instructional materials to be freely shared with computing educators across the United States and around the world. This grant is founded on research on competencies required by computing professionals, which is conducted by a Purdue team including Postdoc Shamila Janakiraman, Research Assistant Deepti Tagare, and volunteer graduate students Suzhen Duan, Ankita Kotangale, and Jafar Tavakoli. The team has also held workshops for University of Alabama and Tuskegee University and created instructional materials which are being piloted in those two institutions but will be shared freely online. The additional staff that are funded from 2023-2024 will aid in creating more instructional materials, while the Purdue team also continues to conduct research.

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.

College of Education CLEAR prior funding, faculty grants from state and federal Departments of Education (2022-23) The College of Education CLEAR carryover: \$143,000 over 3 years; LLDC IDOE grant: \$26,000; PILAR ELL USDE grant: \$20,000; The Center for Literacy and Language Education and Research commits to enhancing the overall quality of literacy and language instruction for PK-12 students through its research, policy transformation, and high-quality teacher development. While the Center focuses primarily on research and dissemination of findings, its activities also include attention and resources for teaching/learning and providing services for schools and educators. The Center aligns with Purdue's College of Education as a "national leader in modeling and nurturing sustainable educational practices and systems for a just society and better world through inclusive excellence, scholarship of discovery, learning, engagement, and development of human potential" specific to literacy and language education (from the College of Education strategic plan Vision, 2021). This includes: (1) Research and dissemination, (2) Teaching and learning, (3) Services for schools.

Signature Programs and Centers

Evaluation and Learning Research Center (ELRC)

Active Evaluation And Learning Research Center Projects:

PERU-Hub, with over \$15,000,000 in funding from USAID, 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. Through the USAID funded LASER

The Arequipa Nexus Institute for Food, Water, Energy, and the Environment project

(\$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, agro-economic 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 (\$3.6M), This project will examine the effectiveness of educational models in Somalia to allow USAID 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 (\$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. ELRC engaged with International Programs in Agriculture to develop and deploy an

LASER Buy-In: Building the Evidence Base on Effective Public-Private Sector Engagement

(\$1,012,422R), 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.

Intercultural assessment of an undergraduate overseas STEM research experience for U.S. students (\$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 the 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;)
- Licensure in High Ability for undergraduates, Purdue College of Education Innovation Initiative
- HOPE+ grant funded by the Jack Kent Cook Foundation
- Graduate assistant leadership through the Gifted Education Research and Resource Institute youth programs' teacher trainings and parent talks
- Scholarships and grants for youth program participation for underrepresented youth, including the Haviland Whiting Scholarships, Jean and Reuben Peterson Scholarships, the local chapter of Kappa Kappa Kappa, and HOPE + Scholar Identity Model Project (funded by Jacob Javits Gifted and Talented Students Education Act)
- Professional development opportunities in talent development for teachers of middle and high school students with high ability through three projects -- INSTEM Project, Positive

Psychology Identification Project, and HOPE + Scholar Identity Model Project – funded by Jacob Javits Gifted and Talented Students Education Act

- Engagement 2. Expand state, national, and international components in programs and research (partnerships, active in organizations/agencies)
- Formal partnership with Busan Metropolitan City Institute for Gifted Education and Promotion, South Korea, to provide professional development on the Scholar Identity Model, the Purdue Three-Stage Model for program and curriculum development, and assistance with the implementation of TSCG in their schools.

Other Partnerships:

- Arizona: Arizona State University*
 - Brazil: Universidade Catolica Dom Bosco (UCDB); Colegio Santo Inacio
 - China: ASDAN China; Dianedu Education Consulting
 - Colombia: Marie Curie School; San Jose de la Vegas School
 - Florida: Xavier House Unlimited
 - Georgia: Valdosta State University*
 - Greece: Anatolia High School; Athena Education Worldwide with eduACT
 - Illinois: Morton Grove; Fox River Grove; Murray Language Academy*
 - Indiana: Indianapolis Public Schools*; Attica
 - Korea: Korean Science Academy
 - Michigan: Bahweting Anishnabe Public School Academy*; Downtown Boxing Gym*, Detroit
 - Minnesota: Nay Ah Shing Tribal School (Mille Lacs Band of the Ojibwe)
 - New Mexico: Navajo Preparatory* and Central Consolidated* Schools (Navajo Nation),
 - South Dakota: Mobridge Pollock Schools*; McLaughlin School District* (Standing Rock Reservation)
 - Tennessee: REACH Memphis; KIPP Academy Nashville* with Vanderbilt University*
 - Javits research sites in GA, ID, IL, IN, MI, NM, SD, and TN, and WI
 - Note. * Indicates research and engagement partnership
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- Translations of GER2I instruments
 - HOPE Scale—Korean and Spanish
 - My Class Activities—Chinese and Korean
 - Student Perceptions of Classroom Quality—Chinese, Korean, Portuguese
 - HOPE+ Scale and Technical Manual to be validated in Spanish.
 - Affective curriculum translated to Portuguese
 - Training on Scholar Identity Model (Dr. Gilman Whiting) for Summer Residential camp counselors
 - Engagement 4. Emphasize talent development of P-12 students and their educators in Indiana

- Sponsor Hazel Feldhusen Teacher of the Gifted Award at the Indiana Association for the Gifted Conference each year
- Positive Psychology grant project partner schools
- GCT graduate students as teaching assistants in Purdue undergraduate teacher preparation program
- Local and state outreach and consulting of GER2I faculty and graduate students

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. CATALYST (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 1, 2023 to December 30, 2023.

2023 Indiana STEM Education Conference

CATALYST sponsored the eighth annual Indiana STEM Education Conference on January 12, 2023. The theme for the 2023 conference was “Advancing STEM with Students.” The Indiana STEM Education Conference provided opportunities for participants to learn about effective STEM education strategies, curricula, and resources to help teachers use research-based instructional practices and increase student achievement related to STEM academic standards. The keynote speaker was Sharita Ware, Engineering and Technology Teacher at East Tipp Middle School and the 2022 Indiana Teacher of the Year. We engaged 10 Purdue undergraduates and 20 Purdue graduate students in the conference activities.

More than 560 STEM teachers/educators from the following 90 school districts attended the conference:

Archdiocese of Indianapolis	Merrillville Community School Corporation
Beech Grove City Schools	Michigan City Area Schools
Benton Community School Corporation	Momence Community School District

Bluffton-Harrison MSD	Monroe County Community School Corporation
British International School of Chicago	MSD Bluffton-Harrison
Brown County Schools	MSD Decatur Township
Career Academy High School	MSD Lawrence Township
Carmel Clay Schools	MSD North Posey County Schools
Carroll Consolidated School Corporation	MSD Pike Township
Center Grove Community School Corporation	MSD Warren Township
Clinton Central School Corporation	MSD Wayne Township
Concord Community Schools	Nettle Creek School Corporation
Daleville Community Schools	New Castle Community School Corporation
Decatur County Community Schools	Noblesville Schools
Delphi Community School Corporation	North West Hendricks Schools
East Allen County Schools	Northeastern Wayne School Corporation
East Washington School Corporation	Northwest Indiana Lighthouse Charter Schools
Eastern Howard School Corporation	Paoli Community School Corporation
Edinburgh Community School Corporation	Plainfield Community School Corporation
Elkhart Community Schools	Portage Township Schools
Eminence Community School Corporation	Purdue Polytechnic
Fort Wayne Community Schools	Richland-Bean Blossom Community School Corporation
Franklin Township Community School Corporation	Rossville Consolidated School District
Frontier School Corporation	Salem Community Schools
Gary Community School Corporation	
Gestalt Community Schools	

Goshen Community Schools	School City of East Chicago
Greater Clark County Schools	School City of Hammond
Greenfield-Central Community Schools	School City of Hobart
Greenwood Christian Academy	Shelbyville Central Schools
Hamilton Southeastern Schools	Sheridan Community Schools
Hasten Hebrew Academy of Indianapolis	South Bend Community School Corporation
Horizon Christian School	Southwest School Corporation
Indiana Connections Career Academy	Tell City-Troy Township School Corporation
Indiana Math and Science Academies	Tippecanoe School Corporation
Indianapolis Public Schools	Tri-Central Community Schools
Jennings County School Corporation	Tri-County School Corporation
Kankakee Valley School Corporation	Twin Lakes School Corporation
Kokomo School Corporation	Union Township School Corporation
Lafayette Catholic Schools	Wes-Del Community Schools
Lafayette School Corporation	West Lafayette Community School Corporation
Lakewood Park Christian School	Western School Corporation
LaPorte Community School Corporation	Whitley County Consolidated Schools
Linton-Stockton School Corporation	Yorktown Community Schools
Lutheran Schools of Indiana	
Maconaquah School Corporation	
Madison Consolidated Schools	
Manchester Community Schools	

2023 Virtual DESIGN STEM Kids Conferences

CATALYST’s virtual DESIGN STEM Kids Conferences were held on May 11 and 12, 2023, and

November 9 and 10, 2023. With funding from General Motors, we partnered with Wabash Valley Education Center to provide opportunities for 4th and 5th-grade students to learn, explore, and engage in inquiry-/project-based STEM activities. In May, students participated in Clean Cut and Let There Be Light. In November, students participated in Robot Artist and Tower Crane. Purdue graduate student volunteers from the College of Education led these engaging, make-and-take STEM sessions during each two-day event.

In the spring, 24 teachers and 681 students participated from the following school districts:

Clinton Central School Corporation	Lebanon Community School Corp.
Delphi Community School Corporation	Maconaquah School Corporation
Eastern Howard School Corporation	North Montgomery School Corporation
Kankakee Valley School Corporation	Rossville Consolidated School District

In the fall, 24 teachers and 439 students participated from the following school districts:

Benton Community School Corporation	Eastern Howard School Corporation
Clinton Prairie School Corporation	Maconaquah School Corporation
Covington Community School Corp.	MSD Warren County

The CATALYST Network is a communication group designed to share opportunities in STEM education with K-12 teachers and schools. The network currently has 58 members.

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, is investigating 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. To date, Dr. Asunda has collaborated with eight rural and diverse K-12 Indiana schools (9 teachers and 300+ students) designated as STEM teaching schools by the Indiana Department of Education. The findings are anticipated to 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.

Citizen Detective

In 2023, three online modules, food fraud, forensic entomology, and wildlife forensic science, were developed. The online modules used scientific reasoning, inquiry, scientific investigation, and evidence evaluation, as a framework to help youth practice their critical thinking in engaging and critically reflecting on concepts and issues from different perspectives. Total 12 youth participants joined the forensic science 4-H Academy in summer 2023. Overall, based on the evaluation, there is room to improve the online modules. In addition, three graduate students and five undergraduate students developed integrated STEM forensic sciences lessons for McCutcheon high school. The lesson topics include soil forensic science, wildlife forensic science, fingerprint lifting, toxicology, and cyber security. The project will turn into a research project in 2024 to explore high school students' identity-based motivation and STEM career interests.

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 work and the decisions teachers make when they select and adapt curricular resources. The team is currently working on Phase II of the project in which they have, to date, conducted individual and focus group teacher interviews at two elementary schools in diverse curricular contexts to explore both the quantitative and qualitative aspects of the teachers' mathematics curricular decision-making. We are exploring teachers' curricular reasoning, curricular vision, curricular trust, and curricular noticing using the interview data. Preliminary findings suggest complex relationships among these constructs and unique interactions depending on the teachers' use of their primary curriculum.

Developing Spatial Visualization and Understanding of Complex Systems via Interactive Mixed Reality Modules: The Professional Formation of Engineers

Dr. Paul Asunda, CoPI, and Dr. Farid Breidi, PI, will examine the efficacy of integrating state-of-the-art mixed reality (MR) technology into advanced engineering technology courses. In this National Science Foundation-funded project (\$199,996), interactive MR modules will be employed as a pedagogical tool to study and enhance students' visualization skills. The proposed research will have a broader influence that benefits society in different aspects, including (1) developing spatial visualization skills that are needed in everyday life situations, (2) advancing the infrastructure of STEM instruction and research, and (3) progressing discovery and promoting learning through the implementation of interactive visual representations.

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. This fatigue training program is anticipated to change behaviors in over 1,000 Purdue students. In addition, it will help student pilots develop healthy lifestyle habits and decision-making skills as they become safer student pilots at Purdue University and 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 fourth year of offering *Engineering by Design* workshops for Purdue University undergraduate elementary education majors and the second year of providing *Engineering by Design* workshops for secondary STEM teachers. *Engineering by Design* (EbD) is a program developed by the International Technology and Engineering Education Association (ITEEA). Led by Dr. Nathan Mentzer, first-grade teacher Tracy Young (Little Falls School District, New York), and Ryan Nixon from ITEEA, 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*, ITEEA's flagship publication, and one-year access to the entire EbD curriculum. To date, 26 Purdue students have completed the workshop and are classroom-ready to implement integrated STEM lessons.

Environmental-STEM (E-STEM)

Environmental-STEM, or E-STEM, is a collaboration between CATALYST (Lynn Bryan, Director), Grand Universe (Greg McCauley, COE), NASA, and Westfield-Washington School District (John Atha, Assistant Superintendent) that was launched in 2022. Dr. Bryan leads a group of graduate students in developing middle school-level integrated STEM units that utilize NASA's Earth Systems Observatory resources. These units align with the most recent Indiana Academic Standards for science and engineering and will be tailored to WWSD middle school teachers' classrooms. The unit is being piloted and learning research conducted in Fall 2023. Dr. Bryan is currently seeking funding for the project.

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, examines 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, and Texas A & M 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. Work with Texas A & M has led to the modification of one gender integration online module. The purpose of the module is to provide educational resources for researchers who are not trained to include gender in their research, but interested in integrating gender into their research design.

GEMS: Girls Excelling in Math and Science

GEMS (Girls Excelling in Math and Science) clubs were started in 1994 by Purdue alumni Laura Jones to encourage students, especially girls, to pursue education and careers in STEM fields. 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. CATALYST adopted GEMS in 2018. In 2023, our Purdue team of faculty, graduate

students, and undergraduate students worked with a GEMS club at Lew Wallace Elementary School in Indianapolis on activities that the Purdue team designed to develop visuospatial reasoning. The Purdue team is developing and researching new visuospatial reasoning activities that can be used in the GEMS curricula and designing facilitator guides to share on the GEMS website for leaders around the world. They are exploring partnerships with the CDF Freedom School, the Imagination Station, and the West Lafayette Public Library as spaces to host GEMS events and to test new curricula with learners in West Lafayette and Lafayette. In 2023, the Purdue GEMS team was comprised of graduate students Yi Zhu and Lisa Nuguid and led by Drs. Rachael Kenney, Signe Kastberg, Laura Bofferding, and the GEMS founder, Laura Jones.

Global Social Justice in Education

Continued collaboration with Dr. JoAnn Phillion, Dr. Bima Sapkota, and Dr. Lili Zhou to disseminate information and findings related to *Global Social Justice in Education (GSJE)*, a virtual intercultural community of educational scholars. Across the four semesters in 2021-22 that it was offered, more than 50 Purdue graduate and undergraduate students collaborated with more than 100 colleagues from seven countries to discuss educational social justice. The teaching team has three published book chapters which describe course design, implementation, and impact, and one study published by two undergraduate students in the *Journal for Purdue Undergraduate Research*. In addition, the team presented at AERA in 2021, 2022, 2023, and has been accepted to present in 2024. In 2023, Dr. Newton, Dr. Phillion, Dr. Sapkota, and Dr. Zhou received a Purdue book seed grant to publish a book that offers 25 activities focused on social justice issues (e.g., activism, diversity, privilege), along with a summary of themes gleaned from the research team's analysis of participants' responses from each activity. This book will provide much-needed social justice-focused activities for multiple potential national and international education audiences.

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 *Indianapolis STEM Teacher Residency (ISTR)* Program aims 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, 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 a year-long academic 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. Partnering schools in IPS include Arsenal Tech High School, Crispus Attucks High School, and Longfellow Middle 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. Currently work with PPHS teachers focuses on creating an Urban Ag + STEM pathway curriculum.

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 project 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 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, which 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 with one week of professional development with activities and materials promoting 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. In summer 2023, 4 workshops for 29 teachers who worked with over 700 students were completed.

National Institute of Education, Nanyang Technological University, Singapore Exchange

From May 20 to May 26, 2023, CATALYST hosted 11 faculty and preservice teachers from the [Department of Natural Science and Science Education in the National Institute of Education at Nanyang Technological University in Singapore](#). This visit is part of an exchange between Purdue's CATALYST and NIE's MeriSTEM Center to share their common interest in K-12 integrated STEM education research and practices. Activities included a campus tour, seminars on integrated STEM education research, classroom visits at Benton Central Jr/Sr High School, and integrated STEM activities at the Celery Bog and Subaru of Indiana. Preservice teachers earned a certificate of completion for K-12 Integrated STEM professional development.

SCALE K-12, Microelectronics in STEM Education

SCALE is a year-long professional development program that includes summer workshops, mentoring, and coaching to teach microelectronics at K-12 schools in Bloomington, Lafayette, and Benton, IN. In 2023, Dr. Guzey, Dr. Moore, Dr. Douglas, and Dr. Hines conducted the *Microelectronics in STEM education* workshop in West Lafayette, IN for 30 attendees.

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 continues annually with participants such as state representatives, mayors, judges, Purdue student-athletes, as well as key Purdue administrators (Provost, Dean of Students, etc.). The center provides games and activities to engage attendees with the content of the Constitution and the Bill of Rights. The event also provides table space for community organizations like the League of Women Voters who do voter registration on site, and Purdue entities like the Civic Literacy Proficiency program, the C-SPAN Center for Scholarship and Engagement, and Purdue Libraries.

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 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 21,000. Annual support from PFCU. Latest speaker was Hon. Marie Yovanovitch, former US Ambassador to Ukraine (150 attendees)

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 2023 workshop was entitled "Being an Upstander" and was led by Liza Wiemer, author of *The Assignment*. The secondary-level book is a fictionalized account of an actual event in which high school students were asked to justify the Nazi genocide of the Jews. The 25 + attendees were very enthusiastic and the Center was able to supply all participants with a copy of the book prior to the event.

Project Citizen High School Showcase. 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. Both the December and May Showcases in 2023 had about 70 students and over a dozen community and campus leaders as panelists.

6th Grade Civics curriculum and professional development. Civic education outreach project. New legislation requires schools to create a Civics course as the second semester of 6th grade Social Studies instruction. Sunnyside Middle School asked the Ackerman Center for support in using Project Citizen to meet this requirement. The Center embraced the opportunity to provide all Indiana sixth grade programs with a free curriculum resource. Since the original request in July of 2022, the Center has developed a scope and sequence, daily teaching plans, and student materials using Center for Civic Education resources to comprehensively address the new Indiana Civics Standards. All materials are now available free to through a noncredit course on the Purdue Online College of Education Professional Development Portal. The Center partnered with the Sunnyside to provide professional development and pilot the materials throughout the school year, culminating in a Showcase which involved 450 students and 15 community volunteer panelists.

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.

GK-12 is one of the most sustainable graduate programs on campus. For 17 years since its inception in 2006, more than 300 graduate and post-doctoral students participated in the program. 12 graduate students participated in the program in 2022 and 7 in spring 2023. The program partnered with 2 local schools: Wea Ridge Elementary and Tecumseh Middle School. 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. 9 articles in peer-reviewed journals were published based on research conducted during GK-12. Data collected from GK-12 was used in a doctoral dissertation in 2023.

University & Community Engagement

Downtown Boxing Gym (DBG) (2013-Present): 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 meetings with potential funders to assist in describing DBG's evaluation plans.

Disability Awareness Program for Young Children (2022, 2023). Special education PhD Candidate Jingyuan Zhang (COE Holmes Scholar), sponsored by her advisor Professor Yan Ping Xin, received Purdue Community Service/Service-Learning Project grants from the Office of Associate Provost for Engagement (2022 and 2023, \$2,360). During 2022, this program reached 73 young children between the age of two to six at Klondike Elementary School (Mrs. Rebecca Alperin). PhD students from the SpEd program including John Augustine, Amanda Austin Borosh, Hannah Crosley, Sungwoo Kang, David Ray Miranda, Charissa Voorhis volunteered in the 2022

program. Zhang and Xin will continue this program in 2023 engaging more students in local elementary schools.

Kinley Trust Proposal Reviewer, College of Education, 2023-24. In the fall of 2023, Professor Toni Rogat reviewed and rated 40 pre-proposals and met to select those invited for full proposals jointly.

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.](#)

Purdue Insights Leadership Program, 2023-24. Professor Toni Rogat was selected COE member for a leadership training program at Purdue University.

Attend Weekly 2-hour leadership meetings and peer group meetings to interact in small groups.

Learning and mentorship related to characteristics of successful academic leaders, diversity and inclusion, building consensus, navigating difficult conversations, recognition, and mentoring of faculty and staff.

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.

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.](#)

University Undergraduate Research Judge. In 2023, Professor Toni Rogat was a research judge for Purdue University.

- Undergraduate spring research conference, March 2023
- Undergraduate fall expo, November 2023

YMCA Camp Tecumseh, Brookston, IN. 2018-present. Dr. Case began collaborating with leaders at YMCA Camp Tecumseh in Fall 2018 based on their desire to identify or develop supportive services for camp counselors. The initial collaboration resulted in the creation of a mental health consultation model that was implemented in summer 2019, 2021, and 2022. The model involves three components: training, consultation, and research.

- Training: Each summer, training is provided to full- and seasonal staff on a variety of topics including listening skills, well-being, stress management, and conflict management.
- Consultation: On-site and on-call services are provided by Dr. Case and Ph.D. students from Purdue's Counseling Psychology program. Dr. Case provides weekly supervision to the students throughout the summer.
- Research: pre-/post- assessments of training are conducted, as well as surveys and focus groups at mid-summer and end-of-summer to assess staff reactions to consultation services for the sake of model refinement and dissemination.

YMCA Camp Copneconic, Fenton, MI. 2022-present. After a presentation at the 2022 Mid-America Camping Conference, the Director of YMCA Camp Copneconic contacted Dr. Case to investigate replicating the mental health consultation model from Camp Tecumseh. After several meetings, a revised version of the model was successfully replicated in Summer 2022 following a similar model as outlined above.

2023 Faculty /Staff Engagement Awards and Recognition

These awards were presented for the 2023-2024 academic year.

University Awards

Outstanding Leadership in Globalization Award – Jill Newton

Faculty Engagement Scholar Award - Wanju Huang

Scholarship of Engagement Fellows - Xiang Zhou

College Awards

Outstanding Faculty Engagement College Award – Jasmine Begeske

Outstanding Leadership in Global Engagement Award – Willie Burgess

Department Awards

Outstanding Faculty Engagement (EDST Tenured Associate Professor) – Nielsen Pereira

Outstanding Faculty Engagement (EDST Assistant Professor) – Amanda Case

Outstanding Faculty Engagement (EDST Ful Professor) – Eric Deemer

Outstanding Faculty Engagement (EDST Clinical) – Jennifer Smith

Outstanding Faculty Engagement (EDCI) - Trish Morita-Mullaney

Outstanding Graduate Faculty Mentor (EDIC) - Brenda Capobianco

Engagement Funding Sources

Addressing Disparities in Autism Spectrum Disorder (ASD) among Burmese Refugee families in central Indiana. (2022-2024); \$75,000 Collaboration in Translational Research, Clinical and Translational Sciences Institute, National Institute of Health.

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

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. (2023-2024). \$5,177,290 and \$255,000 (PI: Lynn Bryan)

EAGER: Developing and Optimizing Reflection-Informed STEM Learning and Instruction by Integrating Learning Technologies with Natural Language Processing. (2023-2025). National Science Foundation. \$300,000 (PI: Muhsin Menekse)

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

Innovation in Quantum Pedagogy, Application and its Relation to Culture (IQ-PARC). (2021-2025). U.S. Department of Defense. \$2,815,000 (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)

Lilly Endowment Inc. (2022-2023); \$161,019: Scaling Up the Reflection-Informed Learning and Instruction by Integrating Mobile Learning Technologies with Artificial Intelligence (PI Muhsin Menekse)

Math Recovery with Michigan City Area Schools. (2021-2023); \$173,304. Indiana Department of Education, Student Learning Recovery Grant Program and Fund. (PI: Feikes, D. Co-PI: Walker, W. S., III.)

Math Recovery with Hobart Schools. (2021-2023); \$140,365. Indiana Department of Education, Student Learning Recovery Grant Program and Fund. (PI: Feikes, D. Co-PI: Walker, W. S., III.)

NSF (01/01/2023- 12/31/2025) \$ 847,844.00/ 125,523.36: /Cyber Training for Open Science in Climate, Water and Environmental Sustainability. (PI: Venkatesh Merwade, Civil Engineering) (Co-PI: Wanju Huang)

NSF (01/01/2020-12/31/2023) \$1,989,709.00 / 25% FTE: Development, Deployment, and Evaluation of Instructional Modules for Current and Future Practitioners of Model-Based Systems Engineering. (PI: Audeen Fentiman, Engineering Education) (Senior Personnel: Wanju Huang) (Program Evaluator: Koehler, Adrie)

NSF (2020-2023) \$773,000: Discovery Research K-12/Multi-University Collaborative Research: Building Community-based Expertise with Elementary Engineering (Co-PI Brenda Capobianco)

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)

Scaling Up the Reflection-Informed Learning and Instruction by Integrating Mobile Learning Technologies with Artificial Intelligence. (2022-2024). Lilly Endowment Inc. via Purdue Innovation Hub. \$161,019 (PI: Muhsin Menekse)

Spencer Foundation (2021-2023) \$500,000: Building Community among Kenyan Teachers and Street Youth through Participatory Action Research. (Co-PI Brenda Capobianco)

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

Aguilar, J., Higbee, T.S., Nichols, B., Lindgren, N.A., Campbell, V., Osos, J., Jeppson, S., Reinert, K. (2023, May). Evaluating the Use of Inclusive Teaching Materials for Learners with Autism. In M. Deshais (Chair) Diversity, Equity, and Inclusion Efforts in Action. Symposium presented at the Annual Association for Behavior Analysis International Convention, Denver, CO. (L)

- Akdemir, Z. G., Li, D., Menekse, M., Hosseini, M., Carlson, E. W., & Dang, N. (2023). Innovation in Quantum Pedagogy, Application, and Its Relation to Culture (IQPARC). *Paper presented as a Research Brief at the Indiana STEM Education Conference, West Lafayette, IN.*
- Anwar, S., Menekse, M. (2023). First-year engineering students' experiences and motivation amid emergency remote instruction. [*IEEE Transactions on Education, vol. 66, no. 4, pp. 330-338, DOI*](#)
- Boden, K., Kuo, E., Nokes-Malach, T., Wallace, T., & Menekse, M. (2023). Investigating the predictive relations between self-efficacy and achievement goals on procedural and conceptual science learning, [*The Journal of Educational Research, 116:5, 241-253, DOI*](#)
- Bofferding, L.*, & Zhu, Y.(g) (2023). Composing tangram puzzles to support shape transformation. *Mathematics Teacher: Learning and Teaching PK-12, 116(7), 503-510.*
- Bolshakova, V.L.J., Johnson, C.C., Sondergeld, T. & Cinowski, T. (2023) *Comparing 10th Grade PSAT Scores Between a Cohort of Urban GEAR UP High School Students and a Non-GEAR UP Prior Cohort.* Hawaii International Conference on Education. Honolulu, Hawaii. January 2023.
- Bolshakova, V.L.J. (2023) *Old, New Approaches: Dry Beans – Good for You – Good for the Planet.* Colorado Fruit and Vegetable Growers Association. Westminister, CO. February 2023. Invited Speaker
- Bolshakova, V.L.J. (2023) *Flavor and the Benefits of Biodiversity: Bridging Lessons from a Montane Ecosystem to Practical Applications on an Organic Family Farm.* Lucia Harrison Colloquium & Gwen Frostic Colloquium Series. The Department of Geography, Environment and Tourism and the Institute of Environment and Sustainability. Western Michigan University. April 2023. Invited Plenary Speaker.
- Butt, A. A., Anwar, S., & Menekse, M. (2023). Work in progress: Uncovering engineering students' sentiments from weekly reflections using natural language processing. Paper presented at the 2023 ASEE Annual Conference, Baltimore, MD.
- Butt, A., Anwar, S., & Menekse, M. (2023). How Do NLP-Supported Scaffolding Techniques Support Students' Written Reflections?. In *INTED2023 Proceedings* (pp. 7450-7450). IATED, Valencia, Spain.
- Butt, A., Anwar, S., & Menekse, M. (2023). Utilizing Automated Scaffolding Strategies to Improve Students' Reflections Writing Process. Paper presented at the Frontiers in Education Conference, College Station, TX.

- Butt, A., Demirci, F., & Menekse, M. (2023). Investigating the Link between Students' Written and Survey-based Reflections in an Engineering Class. Paper presented at the Frontiers in Education Conference, College Station, TX.
- Butt, A., & Menekse, M. (2023). The Impact of Reminder Nudge on STEM Students' Application Engagement. In *INTED2023 Proceedings* (pp. 7992-7992). IATED, Valencia, Spain.
- Cinowski, T., Stafford, B., & Bolshakova, V.L.J. (2023) Building Blocks: Envision, Craft, and Mobilize Year Seven Programming. National Council for Community and Education Partnerships. GEAR UP Conference. San Francisco, CA. July 2023
- Chasse, M., Gochnauer, G., Sapkota, B., Newton, J., & Jones, L. (2023, January 12). *Girls Excelling in Math and Science (GEMS): Stories of the original GEMS girls*. Poster presented at Indiana STEM Conference. West Lafayette, IN.
- Dolby, N. (2023). Multispecies Families: Pets, Community, and Social Action. *Families in Society: The Journal of Social Services* 104 (3), 1-7.
- Hoffman, A., Berry, B., Creager, M., Galindo, E., Huffman Hayes, A., & Newton, J. (2023). What's on the minds of secondary mathematics teacher educators in Indiana? Results from a survey. *HAMTE Crossroads: The Official Newsletter of the Hoosier Association of Mathematics Teacher Educators*, 13(2), 2-7.
- Jannini, A. V. S., & Menekse, M. (2023). A Narrative Literature Review: The Interplay of Motivational Theory and Cognition in STEM Education. Paper presented at the 2023 ASEE Annual Conference, Baltimore, MD.
- Johnson, C., May, T.A., Walton, J.A., & Bolshakova, V.L.J. (2023) Supporting Urban School Students' Preparedness for Post-Secondary Study Through Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP). *Journal of Higher Education Theory & Practice*. 23 (11)
- Johnson, C., Obenchain, K., Suh, Y., and Broome, J. (Eds.) (2023). Rethinking in-service social studies teacher professional development in polarizing times. [Special Issue]. *Social Studies Research and Practice*.18(2)
- Lambert Snodgrass, L., Ghahremani, M., & Hass, M. (2023). Live, learn, work: Experiential learning and cultural intelligence in the internship abroad. *Journal of Global Education Review*, 7(1), 50-63. <https://www.doi.org/10.5038/2577-509X.7.1.1120>

- McCombs, R. G., Lambert-Snodgrass, L. A., & Olenchak, F. R. (2023). A Big Ten Leadership Approach to Service Animal Policy Development in Higher Education. *Journal of Disability Policy Studies*, 10442073231215764.
- Menekse, M. (2023). Envisioning the future of learning and teaching engineering in the artificial intelligence era: Opportunities and challenges. [*Journal of Engineering Education*, 112: 578-582.](#)
- Sapkota, B. K., Zhou, L., Mbewe, R., Newton, J., & Phillion, J. (2023). Fostering pre-service teachers' social justice awareness and intercultural competence through a virtual global community of practice. In C. E. Ullom, & N. Guler, (Eds.), *At school in the world: Developing globally engaged teachers* (pp. 212-237). Rowman & Littlefield.
- Schneider, M., & Lambert Snodgrass, L. (2023). Understanding the concurrent enrollment instructor credentialing cliff from the instructor's perspective: A qualitative study utilizing principal-agent theory. [*Concurrent Enrollment Review*](#)
- Sulu, M.D., Martella, R.C., Bolshakova, V.L.J., Aydin, O., & Erden, E. (2023). A meta-analysis of science education studies for students with intellectual and developmental disabilities (IDD). *Journal of Developmental and Physical Disabilities*. 35 (917-950).
- Zhang, R. and Wessel-Powell, C. (2023). Diversity and Inclusion: Protagonists of Color in Wordless Picture Books. *Journal of Children's Literature*, 49(1), 30-45. Acceptance rate: 8-10%

Presentations

- Aguilar, J. (2023, October 12) *Embedding Culturally Responsiveness in ABA with Families* [Invited Speaker]. Michigan Autism Conference, Kalamazoo, MI, United States (L)
- Aguilar, J & Clay, C. (2023, August 8). *Culturally Responsive Practices for Families Receiving ABA Services* [Invited Speaker]. Continuing Education Event for LEARN Behavioral, online. (L)
- Aguilar, J. (2023, May 3). *Practica de la Sensibilidad Cultural y el Desarrollo de la Tecnica en ACA* [Invited Speaker]. Centro de Investigación e Innovación en Análisis de la Conducta, online. (L)
- Barsch, R., Cruz, L., Murray, T., Lambert Snodgrass, L., & Malhotra, T. (2023, Nov. 13). *Educational Development and Research in Higher Education*. POD Network Annual Conference, Virtual Birds of a Feather Session.

- Bolshakova, V.L.J., Johnson, C.C., Sondergeld, T. & Cinowski, T. (2023) *Evaluating the Academic Impact of a GEAR UP Program on Rural Students: A Quasi-Experimental Cohort Study*. Hawaii International Conference on Education. Honolulu, Hawaii. January 2023.
- Duncan, J. (2023). *Family & consumer sciences education: Creating a vision for the future*, presented at the Mary L. Matthews Club September 20, 2023.
- Duncan, J. (2023). *Inspiring Critical Reflection & Action-- International Federation for Home Economics*, guest lecture Texas Tech University FCS doctoral studies, Dr. Karen Alexander, March 27, 2023.
- Heinold, S., Cinowski, T., & Bolshakova, V.L.J. (2023) *Is College Worth It? Examining and Applying Research Based College Value Messaging*. National Council for Community and Education Partnerships. GEAR UP Conference. San Francisco, CA. July 2023.
- Jenkins, A. & Bolshakova, V.L.J. (2023) *Understanding Postsecondary Awareness and Access through a Community-Based Participatory Research (CBPR) Approach*. American Educational Research Association. Chicago, Illinois. April 2023
- Lambert Snodgrass, L. (Nov. 15, 2023). *Leading in a multigenerational world & workplace*. Leadership White County, Purdue Extension Leadership Program.
- Li, J., Fulwider, D., & Newton, J. (2023, January 12). *Investigating elementary teachers' use of mathematics curriculum materials*. Poster presented at Indiana STEM Conference. West Lafayette, IN.
- Pereira, N. (2023, July). Presenter and Conference Co-Chair, Purdue University, Discover! Institute, Summer Institute for 72 teachers from South Korea and Slovakia.
- Seng, S., & Walker, W. S., III. (2023, October). *Clean cut - Learning about simple machines and engineering design*. Session presented at the National Conference on Science Education of the National Science Teachers Association, Kansas City, MO.
- Sirnoorkar, A. (2023). *Development and analysis of assessments that promote sensemaking in physics*. Session presented at the Physics Education Research Group Seminar, Department of Physics and Astronomy, Purdue University.
- Sulu, M., Martella, R.C., Kiyak, U.E., Grimmet, K., Bolshakova, V.L.J., Poyrazli, S., & Farrell, A. (2023). *Using Self-Monitoring Interventions to Increase On-Task Behaviors of Students with Intellectual Disabilities in Inclusive Classrooms in Turkey (Türkiye)*. Association for Behavior Analysis International, Annual Convention. Denver, Colorado. May 2023

- Tran, K. (2023, July). Culturally sustaining and anti-oppressive teaching approaches to integrated STEM education. Research talk at the Robert Noyce Southeastern Regional Conference.
- Tran, K., Peters, D., & Howard, R. (2023, July). Towards a culturally nurturing rural STEM education. Workshop presented at the Robert Noyce Southeastern Regional Conference.
- Turgeson, S., Duncan, J., & Graves, N. (2023). Securing the CTE teacher educator pipeline: Preliminary survey results. Presented at Association for Career & Technical Education Vision Conference, Phoenix, AZ Nov. 30-Dec. 2, 2023.
- Walker, W. S., III. (2023, February). *Positive norms to promote math achievement*. Session presented at the Hoosier Association of Science Teachers, Inc. & the Indiana Council of Teachers of Mathematics Annual Conference, Indianapolis, IN.
- Walker, W. S., III. (2023, February). *Using different perspectives to provide integrated STEM instruction*. Session presented at the Hoosier Association of Science Teachers, Inc. & the Indiana Council of Teachers of Mathematics Annual Conference, Indianapolis, IN.

Engagement Partnerships

A component Analysis of Interactive Computerized Training

Dr. Juliana Aguilar and her team are in the process of expanding this single subject study to the Mississippi and Purdue campuses. It is a component analysis of a previously validated interactive computerized training on the implementation of activity schedules. Collaborators include Thomas Higbee Utah State University and Stephanie Mattson Mississippi State University. (L)

A Historical Analysis of Indigenous Involvement in AERA and ASEE

The purpose of this project are to understand the landscape of AERA and ASEE for Indigenous scholars and determine how each professional society can engage Indigenous scholars more effectively. This research will also lead to new knowledge about the contributions of Indigenous scholars to the educational research community. Dr. Stephanie Masta is the lead for the project.

Connecting Identity and Place: Understanding Indigenous Graduate Student Experiences in STEM

This project is a longitudinal qualitative study on the experiences of Indigenous graduate students in an Indigenous-focused STEM cohort. The research from this project could lead to best

practices in creating academic environments that best support Indigenous students' development socially, academically, and professionally. Dr. Stephanie Masta is the lead for the project.

Center for Research and Equipment for Assistive Technology in Education

The Center for Research and Equipment for Assistive Technology in Education (CREATE) opened for faculty and students in the College of Education at Purdue University to use in Fall of 2021. Multiple classes utilize both the center located in Beering Hall as well as the mobile carts to demonstrate assistive technology in courses. Pre-service teachers also have access to check out resources and equipment for use with students in their field experiences. CREATE stemmed from a need for students and faculty to have access to both pre-made assistive technology and make-and-take assistive technology to provide high quality instruction for each and every student. The center was established in 2021 with \$100K funding from the Purdue Instructional Equipment Grant. Dr. Jennifer Smith is the lead for the project.

COE CILMAR PROJECT

CILMAR (Center for Intercultural Learning, Mentoring and Research) is leading a campus wide initiative to develop undergraduate students' Intercultural Competencies (IC). As a first step CILMAR is doing inventories of what programs, activities, courses, and assessments are currently underway in colleges aimed at this goal. In order to achieve this goal, Purdue faculty are mapping their courses to ICs. The key impetus for inviting the COE to join this project was our Strands document (which details the philosophical underpinning of our teacher education program), which was identified as being linked to ICs. CILMAR is interested in our mapping to the AACU rubric, but also in how we can extend it, using the Strands, to be unique to the COE and relate to our strengths in social justice (SJ), as they are interested in the intersection of IC and SJ. It is expected that the COE will provide leadership in this campus wide mapping project. CILMAR provided \$25,000 in funds for our use. In addition to the lead personnel faculty in Elementary Education are also facilitating the project: Laura Bofferding, John Broome and Virak Chan. Initial steps are completed and the on-going work of mapping courses and identifying assessments will continue in fall 2023.

Lead personnel: Stephanie Oudghiri and JoAnn Phillion (Curriculum Studies)

Culturally Adapted Parenting Intervention to Address Autism Spectrum Disorders among Burmese American Families

This study seeks to develop a culturally adapted intervention to address the growing needs among Burmese American caregivers who have children with Autism Spectrum Disorder (ASD). Phase I of the project engages with impacted families, clinicians, as well as community leaders to understand the help-seeking experiences among Burmese families. Phase II of the project

examines the preliminary efficacy and feasibility of an 8-week intervention that seeks to increase healthy literacy, parenting self-efficacy, and social support among Burmese caregivers of children with ASD.

Dana Middle School Project

This engagement project, funded by an anonymous donor in the San Pedro/Harbor area of Los Angeles, is directed specifically at Black students who are underrepresented in the school's gifted and talented education programming. Interventions are in the planning stage. Dr. Olenchak is the lead for the project.

Developing community partnerships for residential and online ABA programs

As part of accreditation, all ABA programs must require some practicum placement. Currently, we already require practicum placements for 4+1 and IPE SHINES. In 2023, Dr. Juliana Aguilar is partnering with the TSC school district, Little Star Therapy, Grants House, Linnwood Early Childhood Center, Circle City, and Milestone ABA for residential programs. Agency Affiliation meetings were held with regional centers such as Access Abilities, Lighthouse Autism Services, and Indiana Behavior Analysis Academy. All agencies are interested in entering into formal affiliations with Purdue's ABA Program.

Family College Engagement Project Advisory Committee

Dr. Terron Phillips oversees the development of programming and resources aimed at engaging families (students and families) throughout the college search process in Indiana. The project is in collaboration with Indiana University South Bend and the board of community partners (college professors, administrators, educational organizational leaders, etc.)

Future Matters

Future Matters is a nonprofit organization committed to the skill and academic development of students grades 7th-12th from historically marginalized and disadvantaged communities in South Bend, IN. We support students in their pursuit of their postsecondary educational and career goals by providing the guidance, mentorship, and resources needed for success. Our main focus as an organization is to expose our students to as many postsecondary career and educational paths and to equip them with the skills and resources needed to successfully access the educational and career paths that they believe to be the best fit for them. For our students wishing to attend college, we expose them to a wide variety of college environments by way of fully funded campus visits and college trips. We also provide support in the form of college prep courses and resources (e.g. tutoring and vouchers for standardized tests prep courses). Similar resources are offered to our students aspiring to be college athletes, adding resources (funding for participation in sports camps, film development, and general exposure) needed to be appropriately recruited by collegiate athletic programs. Lastly, we expose our students to career opportunities related to

skills and trades by arranging campus tours at local businesses as well as internship opportunities. Dr. Terron Phillips is the lead on the project.

Global Social Justice in Education

Global Social Justice in Education (GSJE) was a virtual intercultural community of education scholars from seven countries (China, Kenya, Nepal, Tanzania, Turkey, U.S., and Zambia). The GSJE community engaged in bi-weekly meetings with synchronous activities, including intercultural collaborative work and asynchronous experiences such as reflecting on social justice. GSJE included more than 50 U.S. students and 100 international scholars. GSJE was innovative in theoretical perspectives and practical applications, drawing on intercultural competency (e.g., Dearthoff, 2006), social justice in education (e.g., Cazden, 2012), communities of practice (e.g., Lave & Wenger, 1991), and the United Nations 2030 Agenda for Sustainable Development (UN, 2015). We collectively conducted transnational intercultural research (Shad, 2022) that resulted in multiple publications and presentations. We are currently finalizing "Exploring Global Social Justice with International Scholars through Collaborative Activities," an edited book featuring 25 intercultural activities focused on global social justice. Headed up by Dr. Jill Newton and Dr. JoAnn Phillion.

Interprofessional Education for Supporting High-Intensity Needs of Exceptional Students

The IPE-SHINES is a \$1.1M grant from the US Department of Education Office for Special Education Programs to train graduate students to work collaboratively in treating K-6 students with high-intensity needs. Dr. Juliana Aguilar works with the staff and faculty in the Speech-Language Pathology program to advise ABA students and develop and arrange the practicum experience for the ABA students within the partnership. Collaborators include Chenell Loudemill (Department of Speech, Language, and Hearing Sciences) and Jasmine Beigeske (EDST) (L & E)

Intercultural Experiences in Applied Behavior Analysis: Colombia

Dr. Aguilar and colleagues are developing a study abroad course in Colombia for graduate level online and residential ABA students. This will provide students with supervised fieldwork experiences in an intercultural setting. Collaborators include Dr. Alvaro Arturo Clavijo Alvarez at the Universidad Nacional de Colombia in Bogota and Juan Diego Velasquez de Bedout the Director of the Colombia Purdue Partnership and Assistant Director of Global Partnerships. (E)

ISBVI Identifying Best Practices in Teaching Art Community Partnership

In the spring of 2023, Dr. Jasmine Beigeske first gained access to observe an art teacher at the Indiana School for the Blind and Visually Impaired (ISBVI). The teacher, Leslie Walsh, was a long-time art teacher providing instruction to students in kindergarten through 12th grade (approximately 150 students). Dr. Beigeske nurtured a collaborative and ongoing relationship with Ms. Walsh, both having an interest in best practices and improving art instruction for this population. Together they decided that since the literature on this topic was very limited, they

would write a practitioner article summarizing the available research for teaching art to students who are blind or visually impaired and include insights and strategies from the classroom to serve as inspiration for others doing this work. The article was accepted for publication with revision. Dr. Beigeske has presented several conference presentations on this topic to ensure dissemination of this work and her classroom partner, Ms. Walsh will use the article they wrote collaboratively in professional development she provides to teachers throughout the state who educate students who are blind or visually impaired. Their article is a bridge between research and practice, a model for university-school research partnerships, and fills a need in the literature for best practices in serving student who are blind or visually impaired in art class.

Medellin Project

This engagement project, funded by a school in Medellin, Colombia, targets students who are from extremely challenged socioeconomic backgrounds as well as students who represent Indigenous cultures native to Colombia. These populations of students will be involved in a wide variety of activities using the Schoolwide Enrichment Model designed to enable development of talent and for extant talent to be scaffolded in school. Dr. Olenchak serving as lead for this project, and PhD Graduate Assistant Jhon Anthony Careth Henao is assisting. Over time, we hope to shift this engagement effort to research. Lead by Dr. Richard Olenchak.

People's Center/ Reminders for Readiness (R4R)[®]: Early childhood interventions with Somali parents using mHealth technology

Dr. Zhou has partnered with the People's Center Clinics & Services in Minneapolis, Minnesota to develop, pilot, and study the implementation of a universally available, low-cost, personalized mobile Health (mHealth) system to support Somali parents in promoting their children's healthy development from 2017-2019. R4R was initially inspired by existing text messaging interventions used to promote early childhood literacy. However, these existing text messaging intervention programs did not focus on maternal and childhood health and wellbeing. Moreover, existing programs were not developed for non-English speaking communities where health disparities are more prevalent. These other programs also rely on written text messaging which fails to reach individuals with illiteracy in their native or adopted languages. R4R aims to fill this gap in available community-based messaging interventions and thus reduce health disparities in these communities. The goal of R4R is to bridge the health information gap for immigrant, refugee, and racial/ethnic minority parents at a key time in their life as parents, when they have very young children.

Dr. Zhou has collaborated with an interdisciplinary team in creating culturally tailored messaging. Because many immigrant and refugee parents lack literacy in both their native heritage language and English language, we use audio messages in their native and English languages rather than written text messages. One collaborator, Dr. Akosua Addo from the Music Department, helped to

add Somali lullabies to the audio messages. Parents can access voicemail drops through their mobile phones to receive information about infant and toddler health and development. An initial feasibility study in collaboration with People's Center Clinics and Services in Minneapolis found that R4R was easily implemented within a community agency and well-received by Somali parents with young children.

Professional Development Workshops

Dr. Christy Wessel Powel designed and delivered professional development workshops for K-3, 4-6, and 7-12 (see Professional Learning Organized below); Designed and delivered a lending library of 100+ children's books and 'equity kits' for educators at WLCSC. The partnership consisted of Laura Falk, Diversity Equity & Inclusion Director at WLCSC; TJ Rosa, 4th grade, ten grades 3-6 classroom teachers; and TRC staff. In 2022-23, Dr. Wessel Powell spent a total of 40+ hours on the project. The project helped with diversity at Purdue and TRC resources were refined through stakeholder feedback and partnership.

Purdue CDF Freedom School Program

The Purdue CDF Freedom School Program pilot operated for the first time in West Lafayette in the Summer of 2023 in collaboration with First United Methodist Church, who served as a site sponsor. Freedom School is a free six-week, literacy-based summer program for students in grades K-12 (locally we targeted K-5). The mornings start daily with a Harambee celebration (Kiswahili for let's pull together) and following are dedicated to the integrated reading curriculum, which is based on the overarching program theme of I Can Make a Difference! With each week having a unique subtheme; Week 1 (...in myself), Week 2 (...in my family), Week 3 (...in my community), Week 4 (in my country), Week 5 (...in my world), and Week 6 (...with hope, education, and action). The afternoons consist of various activities including STEM engagement, creative writing, field trips, and social action activities. Freedom School encourages a love of reading and learning through a culturally diverse curriculum. The Integrated Reading Curriculum affirms our scholars with engaging literature and exposure to the broader community through addressing an array of local and global social justice topics. Our site hires college-aged students (primarily preservice teachers) to teach and mentor our scholars in classrooms with a 1:10 teacher to student ratio. During the six weeks, we also encourage the parents of our scholars to be engaged in their child's learning through weekly empowerment workshops. In summer 2023 we were proud to partner with the Indy Hunger Network to incorporate the Cooking Matters program within our parent sessions. Our continued goal for this project would be for it to serve as a community-based summer clinic and informal training site where PSTs can practice implementing teaching strategies and techniques acquired from coursework, graduate students apply coaching and qualitative inquiry skills under the guidance of faculty who have opportunities to work collaboratively to address various issues of our participants and stakeholders related to:

- Children’s reading attitudes, motivation, and proficiencies,
- Family/Parent Involvement, literacy, and language practices,
- PSTs dispositions and beliefs around culturally relevant teaching practices and practical experience with relationship building,
- Church involvement, perceptions of ministry work, antiracist pedagogies, supporting and strengthening collaborations of faith-based sponsors of Freedom Schools

Lead/PI: Dr. Breanya Hogue

Study Abroad in Cambodia

Drs. Virak Chan and Wayne Wright led a successful study abroad trip to Cambodia from May 15 to June 2, 2023. Our group spent the first week visiting different historical and cultural sites including Angkor Wat temple complex, Preah Dak village, and the genocide museum. Our participants spent their last two weeks learning to differentiate instruction for special populations including English language learners and gifted students and practicing it through field experiences in a K-12 school in Phnom Penh. Dr. Chan, with his partnered university the Royal University of Phnom Penh (RUPP), organized a series of 9 public workshops on language learning and teaching. Facilitators of these workshops include Virak Chan, Wayne Wright, Kristen Seward, and Vikrant Chap from Purdue University, and 5 faculty members from RUPP. Participants in the workshops include more than 250 pre- and in-service teachers from different educational institution in Cambodia and our study abroad students. Drs. Chan and Wright also met and discussed opportunities for further collaboration with the rector, the dean of the faculty of social science and humanities, the associate dean of the faculty of education, and the director of the institute of foreign languages of RUPP. Purdue’s College of Education and RUPP signed a letter of intent (LOI) in 2019, which has provided our Cambodia Study Abroad program physical space to conduct joined activities with RUPP faculty and students.

Underrepresented Students in Gifted & Talented Education: Positive Psychology Identification & Service

This is a 5-year, approximately \$3 million research project in year two that is funded by PL 107-110 V – The No Child Left Behind Act of 2001, Jacob Javits Gifted and Talented Students Education Grant Program of the U.S. Department of Education. The project applies Positive Psychology interventions in a Dynamic Assessment approach as a means for identifying students who are typically underrepresented in school programs targeting gifted and talent development education. Depending on results at four schools scattered around the nation, we hypothesize that this method for identification can replace traditional testing measures such as IQ for unmasking hidden ability among students of color, those with disabilities, and those from challenging socioeconomic environments, the ones often excluded from school gifted education programming. (Dr. Olenchak serving as PI, while Drs. Seward and Traynor are co-PIs at Purdue, and Dr. Arnstein is the post-doc research associate. They are partnering with co-PI Dr. Ophélie Desmet at Valdosta State University in Georgia)

Using AR to promote learning at local after school program

This project team is using augmented reality (AR) to promote environmental sustainability among underrepresented students at a local after school program in Lafayette, Indiana. William R. Watson, professor of learning design and technology (LDT) in the College of Education, is the director of the Purdue Center for Serious Games and Learning in Virtual Environments. He oversees the environmental sustainability service project with three LDT doctoral students, Deepti Tagare, Anthony Ilobinso, and Chi-Jia Hsieh, who designed, developed, and facilitated the project. Funded by the College of Education's Diversity Fellow grant led by Dolby, aimed to promote an awareness of environmental sustainability among diverse students (ages 6-9 years) by holding workshops at the Hanna Community Center in Lafayette, IN.

The team augmented-reality (AR) based hands-on activities, storytelling, and play based learning. During these sessions, the young learners were virtually transported to a wetland habitat where they explored the flora and fauna and were engaged in specially designed AR activities that focused on educating them about recycling and the reuse of waste materials.

The primary goal was to create awareness about environmental sustainability among diverse students from local minority communities while also offering them the opportunity to interact with an emerging technology like augmented reality. The team realized AR is exceptionally well-suited for promoting learning within the flexible and relaxed contexts found in after school programs. The Purdue team is currently analyzing the collected data, and the next steps involve synthesizing the findings and sharing them through academic publications and conference presentations.

Ongoing Projects

Guzey, S. Selcen, Advisory board member: NSF, DRK-12, Supporting Secondary Students' Earth Science Knowledge and Engineering Design Skills with Mobile Design Studios (2022-2026). The project PI is Dr. Corey Schimpf from SUNY at Buffalo. The project aims to use engineering design work to support secondary students' learning at the intersection of Earth science, engineering design, and socio-scientific disciplinary skills and content.

Guzey, S. Selcen, Advisory board member: NSF, DRK-12, Computational Thinking in High School Biology (2021- 2025). Project PI is Dr. Ido Davidesco from the University of Connecticut. The project aims to enhance students' computational thinking through hands-on neural engineering experiences.

Jennifer Barce oversees the:

- Ivy Tech transfer recruiting for diverse students: The direct admit process was recently approved, and we will target recruiting at Lafayette and Indianapolis as a significant number of students in Indianapolis already travel to IU Bloomington for degree completion.
- Purdue Polytechnic High School recruiting: PPHS recruiting and additional site-specific visits in Merrillville, Fort Wayne, and Indianapolis will take place.
- Passport Project – We are working to secure funding and support opportunities to reduce the barriers in encouraging diverse students to participate in Study Abroad experiences.
- Holmes Scholars – Career support and mentoring development program for promoting diversity and excellence in graduate students.