Purdue’s College of Education exemplifies the university’s land-grant mission by building the pipeline of human potential. We plant the seeds of curiosity and inquiry. We teach, engage and inspire youth and adults to resolve the grand challenges of our day.

The bulk of our engagement initiatives are within the context of P-12 education and the projects described in this report are representative of the kinds of engagement activities facilitated by College of Education faculty on an on-going basis.

**P-12 Schools**

- The clinical nature of our teacher preparation programs requires robust partnerships with P-12 schools across the state. We maintain relationships with 88 school corporations and 150 different schools for the clinical experiences for our pre-service teachers. For student teaching specifically, we collaborated with 100 school corporations and 168 unique schools. Overall, our clinical partnerships include 150 school corporations and 259 schools.

In the 2017-2018 academic year we collaborated with those schools and schools districts to place 302 student teachers (increase of 11.3 % from the prior year) and provide 1657 (increase of 8.8 %) early field placements. Our online special education program had 47 students complete required clinical placements, some of which were outside of Indiana.

These significant partnerships embed our students in the life of a school for extended periods. Early clinical experiences for pre-service teachers range from 16 hours per semester (Theory into Practice component) to 48 hours (methods courses) per semester. The capstone student teaching experience varies by program but ranges from a minimum of 10 weeks and 400 hours to a maximum of 16 weeks and 640 hours.

To provide value added for the participating schools and teachers we offer a tuition-credit voucher program. With a tuition credit voucher, a participating teacher can take a class at Purdue at no cost to them. In August of 2017, teachers in 13 school districts received 110 tuition credit vouchers for hosting students in 2016-2017. During the summer of 2018, these 13 corporations will receive 114 tuition credit vouchers for their partnership during the 2017-2018 year.
• The College of Education, in partnership with the IN DOE, produced and hosted the inaugural Indiana STEM Educators Conference. More than 600 educators from across Indiana and the Midwest traveled to Purdue in January 2018. The conference focused on the latest work in STEM education and research and included more than 100 presentations by educators from P-12 schools and universities.

• The college distributed 960 books to 240 first-grade students in seven area schools through the Susan Nierstheimer Memorial Book Fund. At the bequest of a former literacy faculty member, students who are participating in a school-based reading intervention program books receive a tote bag with four books. The books are selected strategically to motivate young readers to continue building their literacy proficiency. In ten years, over 2300 students have received books through the book fund.

• Professors Laura Bofferding and Signe Kastberg organize several family mathematics nights each semester where preservice elementary teachers engaged with local elementary students and their families around a variety of mathematics activities. These events take place at four local schools and one local community center and involve hundreds of students and their parents. Work with two of the schools has led to subsequent funding in the form of a Purdue Synergy grant, Supporting and Sustaining Problem Solving Conversations with Families. This grant will allow continued development and expansion of the program, and improve the family mathematics nights.

• The College of Education Engagement Office hosted Benton County Promise. More than 500 P-3rd grade students, teachers and parents from Benton county schools visited the campus. The students were greeted by Purdue Pete, the Boilermaker Express, and the band. The students took a campus tour and participated in several STEM-based educational activities, led by pre-service teachers, College Ambassadors, and staff.

• The College of Education Engagement Office hosted almost 200 fourth grade students from Warren County. Each student received a backpack with College information and gifts (e.g., pencils, erasers, stickers). Students also took a campus tour and participated in several STEM-based activities. Students also had the opportunity to experience some Purdue traditions, including Purdue Pete and the Boilermaker Express.

P-12 Partnerships through external grants

Department of Education (DOE)

• A college readiness project, GEAR UP represents the penultimate engagement collaboration. Indiana’s Gaining Early Awareness and Readiness for
**Undergraduate Programs Indiana (GEAR-UP)** provides Purdue with the resources to impact 70,000 students across the state over a seven year period. Now in year two, Carla C. Johnson, professor of Science Education in the College of Education, leads the project, which received $24.5M from the US Department of Education. GEAR UP partners include the Indiana governor’s office, Indiana Commission for Higher Education, The Indiana Department of Education, Conexus, Indiana’s 9 educational service centers, 10 school districts and 4 Purdue campus partners. While GEAR-UP has received significant support from the state and university, it is worth noting that Professor Carla Johnson and the College of Education provided the initiative and germinal resources that made this endeavor possible.

- Number of School Corporations: 10
- Number of Schools: 26
- Number of teachers: approximately 260
- Number of students: 6,000
- In January 2018, GEAR-UP was a major sponsor of the third annual Indiana STEM Education Conference, with over 600 participants. This conference was initiated by Dr. Carla Johnson, COE faculty member and Director of GEAR-UP. It is a partnership with IDOE and CHE.

**National Science Foundation (NSF)**

- **PULSE** is a $1.8 million grant from the National Science Foundation that involves research, teaching, and engagement. The PULSE team is investigating middle school students’ learning of and interest in Life STEM as a result of engaging in instruction that integrates science and engineering design. Please see additional details under CATALYST activities below.

- The **Science Learning through Engineering Design (SLED)** program officially concluded in 2016. However, some scheduled program activities continued into 2017. During the 2017-18 academic year, 172 teachers participated from 75 schools in 53 school corporations. Over the entire grant period, 435 teachers participated (87 participated multiple years) at 98 schools from 62 school corporations.

- Co-PI Professor Brenda Capobianco has secured a $2 million NSF grant to further develop STEM educator preparation through project, **UPDATE**. In 2017, approximately 200 preservice teachers participated in undergraduate science courses, 40 preservice teachers participated in the SLED methods course, and 14 inservice teachers served as mentors of engineering design-based instruction.

- **Engineering to Transform the Education of Analysis, Mathematics, and Science in a Team-Based, Targeted Mathematics-Science Partnership (EngrTEAMS)** is an engineering, design-based approach to teacher professional development led by Assistant Professor Selcen Guzey (Co-PI). Based in the Next Generation Science
Standards, 50 teachers per year design curricular units around science and engineering topics. This five-year, multi-institution project has reached out to over 200 teachers and 50,000 students from five school districts in Minnesota and Indiana.

- **Modeling in Primary Grades** (MPG), led by Professors Ala Samarapungavan and Lynn Bryan conducted empirical research and professional development for teaching inquiry-based, modeling-based science lessons about matter and sound to 2nd grade students. 200 students from four partner schools benefitted from innovative instruction in the physical sciences. The success of the MPG grant led to a subsequent NSF grant for the professors.

- **Sensing Science through Modeling Matter** (S2M2) is a $2.68 million National Science Foundation research grant that has an engagement component. Drs. Lynn Bryan and Ala Samarapungavan collaborate with Concord Consortium (Boston, MA) to develop and research inquiry-based, modeling-based curriculum to support early science kindergarten learning of concepts involving matter and its changes. It will develop curriculum to enable kindergarten students learn concepts involving matter with over 300 students at four sites in Indiana and four sites in Massachusetts. Please see additional details under CATALYST activities below.

- **Leveraging Contrasting Cases to Investigate Integer Understanding**, led by associate professor Laura Bofferding provided experiences for second and fifth grade students to learn negative number concepts. During 2017-2018, 205 students across three schools participated and benefited.

**Math and Science Partnership (MSP) Grants**

- **DesignSTEM** involves K-12 school partnerships with partners who are involved in conceptualizing, writing, and committing to participation for three years in grant. A total of 23 teachers (reaching more than 2500 students in Grades 6, 7, and 8) from 8 partner schools participated in DesignSTEM in 2018. Please see additional details under CATALYST activities below.

**Signature Programs and Centers**

**Gifted Education Resource Institute (GERI)**

GERI's mission is holistic development of giftedness, creativity, and talents among individuals throughout their life span. GERI 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.

College of Education Engagement Report, June 2018
• Total student enrollment from all youth programs in 2017: 807 students

• 336 students from 6 countries, four Native American communities, and 24 states attended the Summer Residential programs, an increase of 5% from 2016.

• **Super Summer Day Camp** (grades K-4) enrollment: 205 students

• **Super Saturday** (K-8) enrollment: 266 students

• As part of the **Colombia Purdue Initiative (CPI)**, 24 students from the Columbus School and Ruta N/ Parque Explora in Medellin, Colombia participated in the Summer Residential experiences. Other international partnerships included the Korea Academy for Gifted Education and the Gangju Science Academy from Korea, schools from Mawhiba, Saudi Arabia and various educational organizations in China.

• A new endowment established by GERI Advisory Board member Gil Whiting sponsored an under-represented middle school student from the Murray Language Academy (Chicago Public Schools) to attend a two-week camp experience. GERI matched this endowment to sponsor a second middle school student.

• Support continued from Shell for the **Shell Scholars** program, which paid for twenty-one under-represented fifth and sixth grade students from the Murray Language Academy (Chicago Public Schools) to attend a one-week camp experience.

**Center for Literacy Education and Research (CLEAR)**

CLEAR involves a comprehensive and wide-ranging collaboration with schools and a research agenda with affiliated faculty who are interested in scholarly pursuits such as evaluating methods, documenting effectiveness, and exploring the processes involved in literacy learning, development, and instruction.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Number of Schools</th>
<th>Number of Teachers</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Literacy Coach Training</td>
<td>7</td>
<td>426</td>
<td>3200</td>
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<tr>
<td>Contracts with Districts</td>
<td>14</td>
<td>350</td>
<td>5250</td>
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<tr>
<td>Literacy Coach Learning Retreat</td>
<td>18</td>
<td>40 Participants</td>
<td>TBD</td>
</tr>
</tbody>
</table>

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

The Center for the Advancement of Teaching and Learning of STEM (CATALYST) focuses on improving STEM (science, technology, engineering, mathematics) education for students from preschool to college. The center (1) conducts theoretically grounded research that contributes to our understanding and advancement of K-12 STEM education; (2) develops partnerships and research collaborations with other institutions, businesses, and agencies.
that support the advancement of K-12 STEM teaching and learning; and (3) informs policy and public support of STEM teaching and learning at the local, national, and global levels.

**DesignSTEM**

- The **DesignSTEM** project aims to help K-12 STEM teachers to enhance their understanding about integrated STEM education and integrate engineering design into their science and mathematics teaching. More specifically, the project goals are: (1) Increase teacher science content knowledge and pedagogical skills using integrated STEM practices; (2) Provide professional development on effective practices, engineering design-based instruction, and inquiry to be used in science instruction; (3) Improve teachers’ skills in developing design-based STEM lessons and curriculum modules; (4) Provide cognitive coaching to teachers on how to implement new teaching materials and pedagogies.

- DesignSTEM is funded by the Indiana Department of Education Math Science Partnership program and CATALYST. Purdue faculty and staff involved include: Selcen Guzey (PI), Lynn Bryan (Co-PI), Minjung Ryu (Co-PI), Paul Asunda (Co-PI), Drew Ayres, Sanjay Rebello, Carina Rebello, and Hui-Hui Wang.

- DesignSTEM involves K-12 school partnerships with partners who are involved in conceptualizing, writing, and committing to participation for three years in grant. A total of 23 teachers (reaching more than 2500 students in Grades 6, 7, and 8) from 8 partner schools participated in DesignSTEM in 2018:
  - Battleground Middle School
  - Central Catholic Junior High School
  - East Tippecanoe Middle School
  - Frankfort Middle School
  - Klondike Middle School
  - Southwestern Middle School
  - Wea Ridge Middle School
  - Rossville Junior High School

**PULSE: Purdue University Life Science through Engineering**

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

- PULSE involves 27 middle school teachers from 13 schools, reaching 1500 students this year. The following schools are project partners:
  1. Battle Ground Middle School
  2. East Tippecanoe Middle School
  3. Klondike Middle School
  4. Wainwright Middle School
  5. Wea Ridge Middle School
  6. Southwestern Middle School
  7. Highland Middle School (Anderson Community Schools)
  8. Frankfort Middle School
  9. Rossville Junior High School
  10. Carroll Junior High School
  11. Delphi Middle School
  12. Kouts Middle School (East Porter County School Corporation)
  13. Northridge Middle School (North Montgomery Community School Corporation)

- Teachers participate in a 2-week online course and one-week (40 hour) face-to-face course at Purdue University each summer. In addition, teachers participate in 15+ hours of professional development in the academic year as a professional learning community.

**Sensing Science through Modeling Matter**

- Sensing Science through Modeling Matter (S2M2) is a $2.68 million National Science Foundation research grant that has an engagement component. Drs. Lynn Bryan and Ala Samarapungavan collaborate with Concord Consortium (Boston, MA) to develop and research inquiry-based, modeling-based curriculum to support early science kindergarten learning of concepts involving matter and its changes.

- In 2018, we conducted over 15 hours of professional development with 2 kindergarten teachers and collaborated on research with 8 teachers. Also involved in the project were 120 kindergarten students from Hershey Elementary School and Wyandotte Elementary School.

**Strengthening Indiana’s Future through the 21st Century STEM Teachers Scholarship**

- Strengthening Indiana’s Future through the 21st Century STEM Teachers Scholarship Program is funded through the Indiana Commission for Higher Education and leverages the numerous school partnership developed through the Center for Advancing the Teaching and Learning of STEM. This project aims to strengthen Indiana’s future by
expanding the number and diversity of students who pursue a degree and career in K-12 STEM teaching and who develop enhanced knowledge and skills for integrating engineering design into science, mathematics, and technology instruction.

- Currently 12 scholarship recipients are completing not only a rigorous plan of study in one or more of the STEM disciplines that leads to state licensure, but also a 12-credit hour Integrated STEM Education Degree Certificate Program in which they develop enhanced knowledge and skills for STEM integration in K-12 instruction.

### Mentoring Schools Seeking Indiana’s Department of Education STEM School Certification

- **CATALYST** mentors Indiana schools that are seeking to become STEM Implementation Schools. We provide STEM auditing, strategic planning and professional development resources that will enable schools to become STEM Schools through the IDOE approved STEM Certification process. CATALYST currently is working with the following schools:
  - Southwestern Middle School
  - Battleground Middle School
  - Klondike Middle School
  - Our Lady of Grace

- In addition to working with Indiana school, CATALYST is piloting a mentoring partnership at the international level. DelCampo Bilingual School in Tegucigalpa, Honduras is seeking to meet the rigorous standards set by the Indiana department of Education for becoming a STEM Implementation school. While the school cannot be certified as a STEM implementation school by the State of Indiana, CATALYST will work with the school to provide STEM auditing, strategic planning and professional development resources that will enable DelCampo meet the IDOE approved full STEM implementation attributes.

### STEM Conference for Kids

- With funding from the Indiana Department of Education, CATALYST hosted a STEM Conference for Kids at Purdue University in April 2018, in partnership with Tippecanoe County Middle Schools.

- More than 1050 6th grade students and 40 teachers from TSC schools participated in inquiry-based, make-and-take STEM lessons sessions such as Bring Music to Life, Exploring Day and Night, STEM in Nursing, Alarming Designs, Doodling Robot, Clean Water for Everyone, From Plant to Plate, Coding with Robot Mouse. CATALYST partnered with organizations including Caterpillar, St. Elizabeth School of Nursing, Purdue Computer Science Outreach, Women in Engineering, Minorities in Engineering, StatCom
P-12 Outreach, American Society of Civil Engineers (Purdue Chapter), and RENEWW House (Whirlpool).

**Canstruction**

- CATALYST sponsored Canstruction, an engineering challenge in which students use math, design skills and art to create structures made out of full cans of food, instilling the importance of community service. This was our first year offering this community outreach activity in collaboration with Food Finders, Tippecanoe Mall, and West Lafayette City Engineering Office. Three teams of middle school students (20 students and three teachers) from 3 local schools participated in the design challenge. Their structures were built and on display at Tippecanoe Mall for one week. Awards were given for Structural Ingenuity, Best Meal, Best Use of Labels.

**International Engagement**

- STEM Service Learning in Nanjing, China is a study abroad program and collaborative effort between CATALYST, the College of Education and the College of Science. Led by Lynn Bryan (PI), David Sederberg, and Drew Ayres, STEM Service Learning offers students STEM service-learning experience in a global context. Undergraduate students learn to work in teams to complete a project that actively engages them in meaningful and personally relevant service activities while building and strengthening their relationship with a K-12 rural school and community near Nanjing, China in the Jiangsu Province. In 2017, 8 Purdue students worked with more than 12 teachers and 350 students in grades 4 and 5 at the Zhushan Primary School in Nanjing, China.

- CATALYST also provides professional development to DelCampo Bilingual School in Tegucigalpa, Honduras. Engaging 134 PreK-12 teachers in professional development courses on topics such as *STEM Integration for Pre-K through 12* and *Using Data from Measures of Academic Progress*, we offer targeted professional development on an as needed basis.

**Industry Partners**

- CATALYST engages a Community and Industry Partners Program which currently includes Caterpillar, Cook Biomedical, Evonic, Salin Bank, and Wintek.

**James F. Ackerman Center for Democratic Citizenship**

James F. Ackerman Center for Democratic Citizenship strives to be a national leader in preparing new generations of American citizens. The focus is to provide programs, activities and resources for educators that result in active student involvement in schools and communities.
During the academic year, the Ackerman Center programming engaged more than 1,500 people including P-12 students and teachers, students and faculty at Purdue, and members of the Lafayette community.

- **Greater Lafayette Holocaust Remembrance Conference (GLHRC)**
  - **Educator Workshop:** 35 middle and high school teachers and 14 Purdue pre-service teachers attended an annual workshop to learn how to include the Holocaust in their curriculum.
  - **Keynote:** Coordinated and provided support for Rep. Lee Hamilton lecture (VanFossen introduced Rep. Hamilton); 100+ Purdue student, faculty, community members

- **We the People...Project Citizen:** An interdisciplinary instructional program for upper elementary, middle and high school students that focuses on state and local government. 32 students from Lafayette Jefferson High School and 13 students from Oakland High school participated in the showcase and about 80 community members attended the showcase,
  - Provided professional development for 12 Lafayette-area students to develop *Project Citizen* project (w/ Purdue Engineering Education Phd-student James Holly)

- **Purdue Series on Corporate Citizenship and Ethics Series**, a collaboration with the Krannert School of Management, hosted one speaker:
  - Reshma Saujani, (Founder, *Girls Who Code*); October, 2018
    - 450 attended in Loeb Playhouse

- **Lafayette Urban Ministry’s Citizenship Preparation Course:** provided instruction and resources to support for 5-week course (taught three times during the year) utilizing approximately 20 volunteers to teach and 45 community residents to prepare for the US Citizenship Naturalization exam on US History and Civics.

- Purdue’s **Constitution Day** Celebration was attended by approximately 350 students, faculty and community members.

**Faculty/Staff Engagement Awards**

Each year, the **Purdue University Office of Engagement** presents several awards to recognize excellence and promote the scholarship of engagement and this year, two College of Education-affiliated faculty were recipients. These university awards:

- reward outstanding accomplishments that exemplify the highest levels of excellence in the scholarship of engagement
reinforce the core characteristics of the scholarship of engagement
promote engagement as a powerful vehicle for fostering impactful

Faculty Engagement Award: **Timothy J. Gibb**, professor, insect biology, college of education. Dr. Gibb has a long track and successful record in the practice and scholarship of engagement. His ability to partner and collaborate with community stakeholders as well as professional peers has led to significant and sustainable impacts, both locally and nationally.

Christian J. Foster Award: **Bill Walker**, research assistant professor, curriculum & instruction; associate director, Indiana GEAR UP. From 2004-2016, Dr. Walker worked as the director for Purdue Science K-12 Outreach. As director, Walker oversaw six outreach coordinators and utilized approximately $1,000,000 per year to improve science and mathematics education in Indiana. Through Science K-12 Outreach, Walker designed research-based programs to bring the latest developments in discipline-based science and mathematics education to classrooms. In 2017 Walker accepted his current position as Associate Director of Indiana GEAR UP which works with schools across the state of Indiana to increase the number of students who are prepared to enter and succeed in post-secondary education and conduct research to better understand student STEM learning, persistence, and entry into post-secondary study and careers.

In addition to university level awards, the College of Education and its departments recognize outstanding engagement and service of its faculty and staff. This year, the College of Education recognized the following:

**College of Education Award Outstanding Faculty Awards:**

- Marcia Gentry, Professor, Department of Educational Studies
- Jim Greenan, Professor, Department of Curriculum
- Denise Whitford, Assistant Professor, Department of Educational Studies
- Ayse Ciftci, Associate Professor, Department of Educational Studies
- Heather Servaty-Seib, Department of Educational Studies

**College of Education Staff Award:**

**The Earl B. Notestine Award** – Dr. Notestine was a long-time member of the College of Education and served as Associate Dean for Academic Services in the College of Liberal Arts. This award recognizes, encourages, and promotes meritorious contributions in the delivery of student services for the College of Education.

- Jennifer Barce, Acting Department Head of Academic Services and Director of the Office of Clinical Practice.

**Community Development**
Purdue’s College of Education faculty and staff provide leadership for community wide education initiatives in Greater Lafayette.

- Assistant Dean for Engagement, Dorothy Reed, serves on the United Way’s Community Commitment to Education (CCTE), a collective-impact committee supported by more than 70 local businesses and non-profit organizations and the 3 local public school corporations. The group fosters education-friendly business practices and a shared commitment to make quality education attainable for all children.

- Assistant Dean for Engagement, Dorothy Reed serves on the education committee for the Lafayette Chamber of Commerce. The Chamber sponsors both the Golden Apple award and the Career Technical and Education awards.

- Maryann Santos, Dean, is a core member of a collective-impact committee comprised of business, industry, community and school superintendents exploring ways to define and express local school accountability. She also serves on the UW Community Commitment to Education.

- The College of Education provides dozens of volunteers (students, faculty and staff) for the Read to Succeed program, which facilitates as a way to increase reading achievement levels of all students by the third grade. The college encourages employees to take an hour each week – in paid status – to work with students in local elementary schools.