Women in Engineering K-12 Outreach Programs
Sue Bayley, Dr. Jennifer L. Groh

BACKGROUND

The Women in Engineering Program (WIEP) at Purdue University is dedicated to enriching the profession of engineering through the full participation of women. We conduct research on & develop & direct activities which provide encouragement for women to study engineering. Well-documented and recent trends show an alarming decline in enrollment of women in undergraduate engineering programs across the country. One explanation for this trend is K-12 students’ perception of what an engineer is & does. The WIEP K-12 outreach initiatives work to replace the often negative stereotype of an engineer with positive role models, creative & talented individuals solving problems that address some of today’s most pressing concerns. The goals of our outreach programming include providing opportunities for students to explore the field of engineering through hands-on activities, to find out how engineers are positively shaping our world, & to learn more about themselves and others by completing challenging activities that involve creativity & teamwork.

IMAGINATION, INNOVATION, DISCOVERY & DESIGN (I2D2)

- After-school academic year program for K—5th grade boys and girls.
- Directed by the WIEP Outreach Coordinator & implemented with assistance of over 40 undergraduate engineering students who work in small teams during each site visit engaging participants in hands-on engineering activities.
- Annually, over 1000 K-5 students participate through three after-school centers in the Greater Lafayette area & a bi-annual Open House.
- The activities give K—6th grade students the opportunity to work together, solve problems, test prototypes, and redesign for better solutions while allowing them to explore every discipline of engineering.

INNOVATION TO REALITY (I2R)

- After-school academic year on-campus program for 6-8th grade boys & girls.
- Each 5-week themed session is based on Purdue faculty research such as Alternative Energy, Life Solutions, Food, Health, Water Scarcity, & Space.
- I2R is directed by the WIEP Outreach Coordinator & curriculum is developed/implemented by science & engineering graduate students &/or faculty members.
- Undergraduate students oversee small groups of 4-5 & serve as mentors to I2R participants.
- Each year, approximately 25 graduate & undergraduate students reach out to over 70 middle school students in 2+ themed sessions.

ENGINEERING FYI: FOR YOUR IMAGINATION

- One day on-campus program geared towards girls entering 7th-8th grade.
- Each participant is matched with a current engineering student & attends three hands-on engineering activities.
- Approximately 100 current students across all Purdue Engineering Schools volunteer. Faculty & staff also contribute to hands-on activities.
- Each year, FYI engages over 100 participants and parents can participate in a short Parent Session on encouraging their daughters’ interest in engineering.

YWCA: MOTHER-DAUGHTER ENGINEERING EVENT

- Local YWCA one-day event inviting mothers and daughter to explore engineering together.
- Mothers learn about appropriate messages for encouraging their daughters’ continued interest in engineering.
- Undergraduate and graduate engineering students interact with the mother-daughter pairs as they work on engineering-related projects.
- Day culminates with a reception where fathers and siblings can view the projects.

ACCESS RESIDENTIAL & DAY CAMP VISITS

- Partnering with local summer residential & day camps for K-8th grade boys and girls.
- Each summer we anticipate impacting over 700 students with the goals of increasing the positive perception of engineering/engineers, increasing interest in engineering careers and providing information on how to pursue this new interest.
- Community partners include: Brothers Drive, Kinder Care, Girl Scouts of Central Indiana, Hannah Center, Just Us Kids Early Learning Center, YMCA, YWCA, Purdue Athletes Life Success Program.

ACCESS ENGINEERING

"Before attending, I had no idea what engineering was! I really loved it [FYI] and learned so much about engineering." - FYI Participant

"I believe it helps girls see a different "side" of engineering." - Mother from YWCA Event

"The best thing about IGED was... "The activities, mentors, and learning what engineering really is. This has helped me to confirm that engineering really is for me." - IGED Participant

"I love I2D2, You don’t realize just how exciting engineering is until you see a group of second graders practically yelling in anticipation for the activity." - Undergraduate Student I2D2 Facilitator

"Women in Engineering K-12 Outreach Programs Sue Bayley, Dr. Jennifer L. Groh

ACCESS RESIDENTIAL & DAY CAMP VISITS

• Partnering with local summer residential & day camps for K-8th grade boys and girls.
• Each summer we anticipate impacting over 700 students with the goals of increasing the positive perception of engineering/engineers, increasing interest in engineering careers and providing information on how to pursue this new interest.
• Community partners include: Brothers Drive, Kinder Care, Girl Scouts of Central Indiana, Hannah Center, Just Us Kids Early Learning Center, YMCA, YWCA, Purdue Athletes Life Success Program.

ACCESS ENGINEERING

• One day on-campus program geared towards girls entering 7th-8th grade.
• Each participant is matched with a current engineering student & attends three hands-on engineering activities.
• Approximately 100 current students across all Purdue Engineering Schools volunteer. Faculty & staff also contribute to hands-on activities.
• Each year, FYI engages over 100 participants and parents can participate in a short Parent Session on encouraging their daughters’ interest in engineering.

ENGINEERING FYI: FOR YOUR IMAGINATION

• Partnering with local summer residential & day camps for K-8th grade boys and girls.
• Each summer we anticipate impacting over 700 students with the goals of increasing the positive perception of engineering/engineers, increasing interest in engineering careers and providing information on how to pursue this new interest.
• Community partners include: Brothers Drive, Kinder Care, Girl Scouts of Central Indiana, Hannah Center, Just Us Kids Early Learning Center, YMCA, YWCA, Purdue Athletes Life Success Program.

YWCA: MOTHER-DAUGHTER ENGINEERING EVENT

• Local YWCA one-day event inviting mothers and daughter to explore engineering together.
• Mothers learn about appropriate messages for encouraging their daughters’ continued interest in engineering.
• Undergraduate and graduate engineering students interact with the mother-daughter pairs as they work on engineering-related projects.
• Day culminates with a reception where fathers and siblings can view the projects.

IMAGINATION, INNOVATION, DISCOVERY & DESIGN (I2D2)

• After-school academic year program for K—5th grade boys and girls.
• Directed by the WIEP Outreach Coordinator & implemented with assistance of over 40 undergraduate engineering students who work in small teams during each site visit engaging participants in hands-on engineering activities.
• Annually, over 1000 K-5 students participate through three after-school centers in the Greater Lafayette area & a bi-annual Open House.
• The activities give K—6th grade students the opportunity to work together, solve problems, test prototypes, and redesign for better solutions while allowing them to explore every discipline of engineering.

INNOVATION TO REALITY (I2R)

• After-school academic year on-campus program for 6-8th grade boys & girls.
• Each 5-week themed session is based on Purdue faculty research such as Alternative Energy, Life Solutions, Food, Health, Water Scarcity, & Space.
• I2R is directed by the WIEP Outreach Coordinator & curriculum is developed/implemented by science & engineering graduate students &/or faculty members.
• Undergraduate students oversee small groups of 4-5 & serve as mentors to I2R participants.
• Each year, approximately 25 graduate & undergraduate students reach out to over 70 middle school students in 2+ themed sessions.

INTRODUCE A GIRL TO ENGINEERING DAY (IGED)

• One day on-campus program held in conjunction with National Engineers’ Week for early high school students.
• Each participant is matched with a current engineering student & attends three hands-on engineering activities based on their interest.
• Approximately 100 current students across all Purdue Engineering Schools volunteer. Faculty & staff also contribute to hands-on activities.
• Each year, IGED engages over 185 participants and parents can participate in a short Parent Session on encouraging their daughters’ interest in engineering.