ENGINEERING EDUCATION IN PRE-KINDERGARTEN THROUGH FIFTH GRADE

Monica E. Cardella (Purdue University), Gina Navoa Svarovsky (University of Notre Dame), Scott Pattison (TERC)

- Pre-College Engineering Education Research is a growing field– with a rich empirical and theoretical basis – that is distributed across multiple communities of practice.
  - Engineering education is it's own distinct field – but also an integral part of integrated STEM
  - Engineering design is a particularly promising area of focus, but there's more to engineering than design
  - NGSS articulates big ideas related to engineering design, but the rich empirical and theoretical basis for engineering design should also be considered
- Concerns for equity and access have long motivated pre-college engineering education work – with still more work needed
  - Outreach → education
  - Engineering for all → engineering experiences designed for specific communities
  - Engineers as the holders of engineering knowledge → recognizing the ways teachers and families are already engaging in engineering-related activities

ENGINEERING DESIGN IN PRESCHOOL-5TH GRADE

- Emphasis on understanding and identifying problems – not on building and construction
  - Problem scoping in addition to problem solving
  - Provides learners opportunities to identify, understand and solve problems related to one's own community
  - Provides educators opportunities to situate engineering within socially relevant/social justice contexts as a way to build empathy and civic engagement
- Facilitates integration with science, mathematics, computational thinking, literacy, and social studies
- Related to other aspects of development that are critical for young learners (e.g., executive function, mastery motivation, socioemotional learning, and theory of mind)

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