

K-12 Engineering Education Projects at the National Academies

ASEE Deans Public Policy Colloquium

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Washington, D.C.

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Projects of Potential Interest

- **Educator Capacity Building in K-12 Engineering**
- **Science Investigations and Engineering Design Experiences in Grades 6-12**

Educator Capacity Building: Rationale for the Study

- **Demand for engineering-literate PreK-12 educators is growing (e.g., NGSS, AP Engineering, integrated STEM initiatives)**
- **The number of educators prepared to teach PreK-12 engineering is small relative to likely demand**
- **There are very few pre-service programs in universities that include engineering coursework for newly minted teachers**

Rationale (cont.)

- **State teacher credentialing policies for engineering educators are limited and underutilized**
- **PD opportunities for in-service educators to gain exposure to engineering vary dramatically in content, quality, cost, and availability.**

Study Goal

Understand current and anticipated future needs for engineering-literate PreK-12 educators in the United States and how these needs might be addressed.

Statement of Task

The Statement of Task focuses attention on questions in three key areas:

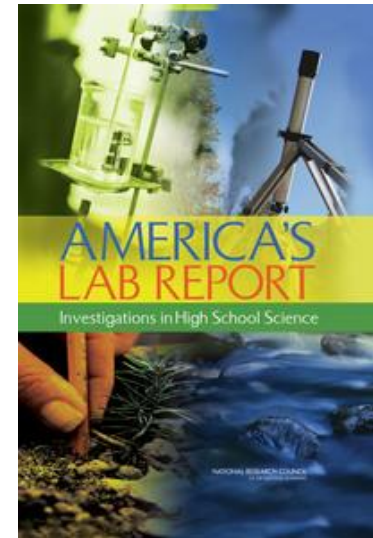
- The Preparation of PreK-12 Engineering Educators
- Professional Pathways for PreK-12 Engineering Educators
- The Role of Higher Education

Selected Questions from the SOT

- **What appear to be the most promising educator-preparation practices currently in use?**
- **What are the practical and policy impediments to instituting effective credentialing for PreK-12 engineering educators, and how they might be addressed?**
- **What roles are or might post-secondary institutions, including but not limited to four-year engineering and engineering technology programs, play in the preparation of PreK-12 engineering educators?**

Science Investigations and Engineering Design Experiences in Grades 6-12

- Revisits *America's Lab Report: Investigations in High School Science (2006)*
- Scope expanded to include middle school



Statement of Task

Provide guidance for designing and implementing science investigations and engineering design for middle and high school students that takes into account the new vision for science education embodied in the *Framework for K-12 Science Education* and standards based upon it.

Topics Addressed in Project Information Gathering

- **The Role of the Teacher**
- **Professional Development**
- **Student Use of Evidence**
- **How Engineering is Included**
- **Role of Technology**
- **Inclusive Pedagogy**

LinkEngineering

The screenshot shows the LinkEngineering website homepage. At the top, there is a navigation bar with links for HOME, LOGIN, JOIN LINKENGINEERING, ABOUT, CONTACT, and HELP. A search bar is also present. Below the navigation bar, the main content area features a large background image of students working. In the center, a circular diagram contains the words ASK, IMAGINE, PLAN, CREATE, and IMPROVE, connected by arrows in a clockwise cycle. To the left of this diagram, there is a teal box titled 'LINKENGINEERING RESOURCE' and 'PRESS RELEASE' with a sub-headline 'NAE's LinkEngineering Website Launches Collaboration with TeachEngineering Digital Library' and a 'READ MORE' link. To the right, there is a red box titled 'LINKENGINEERING BLOG' with a sub-headline 'INSPIRING WONDER: HOW TO PREPARE FOR ENGINEERS WEEK' and a quote: 'What are you going to do to celebrate engineering in your community? We have lots of ideas to get you started.' with a 'READ MORE' link. The browser's address bar shows 'https://www.linkengineering.org/' and the taskbar at the bottom displays various application icons and the system clock showing 4:09 PM on 2/5/2018.

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QUESTIONS?