



Introduction to LinkEngineering

Dr. Elizabeth Cady, National Academy of Engineering

Dr. Elizabeth T. Cady is a Program Officer at the National Academy of Engineering (NAE), where she facilitates the deployment of innovative policies, practices, and tools designed to enhance the effectiveness and efficiency of systems for the formal, informal, and lifelong education of engineers. She staffs the Frontiers of Engineering Education symposium and also co-edited a collection of resources that translated research on women in science and engineering into short documents containing practical tips for faculty members to incorporate into their classrooms and other interactions with students. She is a co-author of several peer-reviewed conference presentations on engineering education topics such as building skills in project management and change leadership, diversity, and developing communities of practice within engineering education and engineering education research. She currently helps lead a project that will develop a toolkit to guide teachers, administrators, and other stakeholders in the effective implementation of engineering education in K-12. Dr. Cady earned M.S. and Ph.D. degrees in Cognitive and Human Factors Psychology from Kansas State University and a B.A. in psychobiology and political science from Wheaton College in Massachusetts.

Greg Pearson, National Academy of Engineering

Greg Pearson is a Senior Program Officer with the National Academy of Engineering (NAE) in Washington, D.C. Greg currently serves as the responsible staff officer for the NSF-funded project "The Status, Role, and Needs of Engineering Technology Education in the United States." He is also study director for the Chevron-funded project, Guiding Implementation of K-12 Engineering in the United States. He was the study director for the NAE and National Research Council project that resulted in the 2014 report, STEM Integration in K-12 Education: Status, Prospects, and an Agenda for Research. He was the study director for the project that resulted in publication of Standards for K-12 Engineering Education? (2010) and Engineering in K-12 Education: Understanding the Status and Improving the Prospects (2009), an analysis of efforts to teach engineering to U.S. school children. He oversaw the NSF-funded project that resulted in the 2013 publication of Messaging for Engineering: From Research to Action and the 2008 publication of Changing the Conversation: Messages for Improving Public Understanding of Engineering and was co-editor of the reports Tech Tally: Approaches to Assessing Technological Literacy (2006) and Technically Speaking: Why All Americans Need to Know More About Technology (2002). In the late 1990s, Greg oversaw NAE and National Research Council reviews of technology education content standards developed by the International Technology Education Association.

Mr. Cary Ivan Sneider, Portland State University

Cary Sneider is Associate Research Professor at Portland State University in Portland, Oregon. He serves as Co-Principal Investigator on Science in the Learning Gardens, an NSF grant to Portland State University, and Engineering for All, an NSF grant to Hofstra University. Dr. Sneider also serves as a Consultant on STEM Education for the Noyce Foundation and the Stephen D. Bechtel Jr. Foundation, and on several advisory boards. He is the Chair of the LinkEngineering committee.

WORKSHOP PROPOSAL FORM

2015 Annual ASEE K-12 Workshop on Engineering Education
“Authentic Engineering: Representing & Emphasizing the E in STEM”
Presented by Dassault Systems

Saturday, June 13, 2015
8:00 A.M. – 5:00 P.M.
Sheraton Seattle | Seattle | WA

Please complete this form, save it as a PDF file *only* and upload it through the ASEE Paper Management system as shown in the K12 Workshop Presenter’s Kit.

All notifications will be by email from the ASEE Paper Management system.

NOTE: To ensure that emails are not obstructed by spam blockers, please make sure to WHITELIST the email addresses: monolith@asee.org and conferences@asee.org and s.harrington-hurd@asee.org.

Direct questions to Stephanie Harrington-Hurd, ASEE K-12 Activities Manager, at s.harrington-hurd@asee.org. Additional workshop details are available at: <http://www.asee.org/K12Workshop>. Thank you!

Deadline

Friday, January 23, 2015 by 5:00PM EST

Presenters will be notified of acceptance status by March 14.

Late submissions will not be accepted.

Advanced Workshop Registration will open December 6, 2013.

SUBMISSION INFORMATION

Provide the first and last name of each presenter, including affiliations. If there is more than one presenter, designate one person as the organizer and provide only that person’s contact information. The organizer is responsible for communicating to co-presenters.

Number of Presenters: Three

Presenter Name(s):

- 1) Last Cady First Beth Affiliation National Academy of Engineering
- 2) Last Pearson First Greg Affiliation National Academy of Engineering
- 3) Last Sneider First Cary Affiliation Portland State University

Contact Person’s Name: Beth Cady

Contact Person’s Email: ecady@nae.edu

Contact Person’s Phone: 202-334-2064

Contact Person’s Alternate Phone:

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Please provide a one-paragraph bio for each presenter (in the order listed above). The bio should not exceed 70 words and should be written as you would want it to appear on the ASEE website and program materials.

1) Beth Cady is a Program Officer at the National Academy of Engineering, where she facilitates the deployment of innovative policies, practices, and tools designed to enhance the effectiveness and efficiency of systems for the formal, informal, and lifelong education of engineers. She is the co-director for the LinkEngineering project.

2) Greg Pearson is a Senior Program Officer with the National Academy of Engineering in Washington, D.C. Over the past two decades, Greg has led projects related to technological literacy, public understanding of engineering, integrated STEM education, and PreK-12 engineering education. He is the study director for the LinkEngineering website project.

3) Cary Sneider is an Associate Research Professor at Portland State University and is also Co-Principal Investigator on two NSF grants: Science in the Learning Gardens at Portland State University, and Engineering for All, at Hofstra University. Dr. Sneider also serves as a Consultant on STEM Education for the Noyce Foundation, the Stephen D. Bechtel Jr. Foundation, and on several advisory boards. He is the Chair of the LinkEngineering committee.

WORKSHOP INFORMATION

Proposed Title:

Introduction to LinkEngineering

Abstract: Please provide a concise description that includes the workshop’s learning objectives (maximum 750 characters). The abstract is used on the ASEE website, program materials, and other K-12 Workshop promotional activities.

The National Academy of Engineering is developing a new website to provide support for teachers, informal educators, administrators, and teacher educators implementing engineering in preK-12 education. Attendees will learn about the site’s features and will be able to explore the site, download resources, and interact with others in a virtual community of practice. In addition to creating their own profile on the site so they can download resources and interact with others, attendees will be provided a quick-start guide to share with their colleagues.

Workshop Description. Please provide a detailed description of the proposed workshop that, at minimum, explicitly addresses the following (maximum 4,000 characters):

- a. Learning objectives

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- b. Hands-on activities and interactive exercises
- c. Materials that participants can take with them
- d. Practical application for teachers and outreach staff

Attendees will learn about the site from a brief presentation that will provide an overview of the features, including the available resources such as videos and lesson plans and a community of practice that includes educators and others with diverse experience in preK-12 engineering education. The presentation will describe how the resources and community can help attendees and their colleagues implement engineering education that accurately reflects core ideas and practices, is evidence based, and attends to relevant standards practices. Following the presentation, attendees will briefly familiarize themselves with the site by either joining the community and creating their own profile or browsing the site anonymously. Once attendees have had a chance to browse the site they will be given an assignment to design a lesson they can use in their classroom. We will ask them to follow the engineering design process to ask themselves what topic they want to teach, imagine a good activity for their class, use the website to plan and create that activity, and then ask one of site’s experts for feedback on ways to improve the activity. In addition to having the experts be available virtually on the site, we will invite experts to be in the room to provide immediate feedback. During the course of the workshop, attendees will learn how to search for, download, and comment on resources that could help them in their work as well as search for a colleague who could provide mentorship or other advice. Attendees will leave with access to the site along with a “quick-start guide” that will remind them of the site’s features, search terms, and organization. All attendees will gain practical information related to 1) what resources exist on the site; 2) how to access, use, and rate those resources; and 3) how to search for and connect with peers, mentors, or coaches who can support them as they implement engineering in preK-12 education.

Authentic Engineering Connection. Identify and describe how you will explicitly address the ways in which your lesson or activity is representative of the processes, habits of mind and practices used by engineers, or is demonstrative of work in specific engineering fields.¹ At least one of those must be within the first four listed, below; i.e., do not only check “other”. Check all that apply:

- Use of an engineering design process that has at least one iteration/improvement
- Attention to specific engineering habits of mind
- Attention to engineering practices (as described in the NGSS/Framework and as practiced by engineers)
- Attention to specific engineering careers or fields related to the lesson/activity
- Other (please describe below)

Provide a description of how you will explicitly address these aspects of authentic engineering in your workshop (maximum 2,000 characters):

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The NAE has followed the engineering design process in developing the LinkEngineering website, and we expect the site’s users to incorporate some elements of engineering design in their interactions with the site. Various stakeholder groups, including teachers and teacher educators; curriculum and assessment developers; administrative leaders at the school, district, and state level; and educators and program developers working in after- and out-of-school settings have provided input to NAE on their concerns and needs regarding implementation of engineering education at the preK-12 level. This input is driving development of the site’s contents, structure, and features. The website has undergone several iterations based on stakeholder feedback and will continue to be improved. During the workshop itself, attendees will develop an activity to use in their classroom using a version of the engineering design process. In addition, the quick-start guide that will be provided to the attendees will explain where to find the resources on the site that address the engineering design process, engineering habits of mind, engineering practices, NGSS-related content, and information on specific engineering fields and careers.

Diversity. This year is the American Society for Engineering Education’s “Year of Action on Diversity.” It is essential that we have a diverse engineering workforce to solve diverse problems. To do that and to have an engineering-literate public, it is essential that we reach *every* preK-12 student with high-quality engineering education, drawing on issues of access and equity in the classroom and in the curriculum. Reviewers would like to know how your proposed workshop will address diversity.

Provide a description of how you will explicitly address diversity – e.g., diversity with respect to gender/sex, ethnicity or race, special education inclusion, socio-economic status, or LGBT status – in your workshop (maximum 2,000 characters):

The site is being developed with diversity as a core feature. The site design and resources will be inviting and engaging to all educators and children and will follow principles that foster inclusivity and equity, such as 1) setting learning in a real-world context, 2) presenting authentic engineering design challenges, 3) scaffolding student work, and 4) demonstrating both that “everyone engineers” and that everyone can be an engineer. The website will also include resources that are focused on helping educators support diverse students, including some that explicitly state why diversity matters and why equity practices are good for everyone. In addition, the site will include evidence-based practices that support recruitment and retention of underrepresented groups in engineering, provide tips to avoid practices that discourage inclusivity, and be designed for universal access of all individuals. During the workshop, we will explain how the site incorporates diversity and inclusivity.

Are there any online components to the proposal or presentation? (Note that these online components may only be available to presenters or those who have their wireless subscriptions, since wireless may not be available during the workshop sessions.)

No

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Yes

Please describe:

Although the introduction to the website can be accomplished with a slide presentation without Internet, the hands-on portion of the workshop will require attendees to bring laptops and access the internet. If necessary, we are willing to pay for enhanced Internet access in the workshop room to ensure all attendees will have an authentic website experience.

Grade Level Target Audience (check all that apply):

- Primary (EC–2)
- Elementary (3–5)
- Middle School (6-8)
- High School (9-12)

Maximum Number of Participants:

25

If this number is greater than 25, please describe how your workshop will equally engage all participants.

All Seating is Classroom (tables and chairs).

Audio Visual Equipment Requests:

Note: An LCD projector, screen and podium with attached microphone are provided. Requests for additional equipment or resources (e.g., internet connection or laptops) will incur extra charges. If you do not have additional requests, please indicate with “Not applicable.”

The workshop will require an Internet connection that will allow all the attendees to access the website. We will ask all attendees to bring laptops with them, but for those who are unable to bring one we may have to rent extra.

Reminder:

Presenters must register and pay the registration fee to support their workshop attendance and audio/video costs.

Thank you for completing this proposal form!

Please review this document prior to submitting it to ensure that all items are complete.

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Date Received:

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