



## Workshop

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# STORYTELLING FOR IMPACT: RESOURCES TO SUPPORT COMMUNICATION FOR GLOBALLY RESPONSIBLE ENGINEERING

S.J. Hitt<sup>a,1</sup>, J. Truslove<sup>b</sup>, C. Cooper<sup>c</sup>

<sup>a</sup> New Model Institute for Technology and Engineering (NMITE), Hereford, UK, 0000-0002-0176-6214

<sup>b</sup> Engineers Without Borders UK, London, UK, 0000-0001-5671-0616

<sup>c</sup> The Lemelson Foundation, Portland OR, USA, 0000-0001-7253-4042

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## ABSTRACT

Effective communication is essential within engineering education and practice, especially when needing to work with diverse stakeholders, establish credibility, evidence impact, and articulate visions for the future. Communication skills are therefore critical to fostering trust, generating ideas, cultivating relationships and shaping a culture capable of meeting ambitious goals towards more globally responsible engineering that prioritizes ethics, sustainability, and equity. Resources such as the Lemelson Foundation's Engineering for One Planet Framework, the Engineering Professors' Council's Ethics and Sustainability Toolkits, and Engineers Without Borders UK's Reimagined Degree Map all support the teaching and development of communication skills, but they also underpin the ability to tell a new story around the power of transforming engineering for positive change. This workshop harnesses these resources to equip participants with the additional communication tool of storytelling. Analyzing examples of effective storytelling in engineering and learning key storytelling techniques will enable participants to understand how storytelling practices can increase their own efficacy in

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<sup>1</sup> Corresponding Author  
S.J. Hitt  
sarah.hitt@nmite.ac.uk

communicating stories of change, and how a storytelling approach is relevant to student communication learning outcomes.

## **1 BACKGROUND AND RATIONALE**

### **1.1 Context**

As a human-centred activity, engineering is impossible without communication. It is well-acknowledged in academia and industry alike that skills in communication are essential for engineers, particularly in the context of Industry 4.0 and the globalized nature of work (Wu, Xu, & Philbin, 2023; Riemer, 2002). This is especially important given that engineers are frequently working on technical innovations that may not be easy for a person with non-technical expertise to understand, yet the impact of those innovations may be far-reaching and affect many aspects of culture, policy, and the environment.

In this workshop we draw in on three bodies of work that position communication skills within globally responsible engineering education and practice, and which support students and educators to develop these skills in different ways: the Lemelson Foundation's Engineering for One Planet (EOP) Framework, the Engineering Professors' Council's (EPC's) Ethics and Sustainability Toolkits, and Engineers Without Borders UK's (EWB UK's) Reimagined Degree Map. With the aim of supporting engineering educators to integrate sustainability, ethics, and justice within all aspects of engineering degrees, these resources also emphasise the importance of communication and the related skills that everyone within the engineering system needs in order to effectively articulate the meaning and impact of engineering that prioritizes global responsibility.

Indeed, critical to the ability to make changes to modules, programmes, and courses as well as to the way we practice engineering and evaluate success is telling stories of the need for change or the effects of positive change (Cleland Silva & deTarso Fonseca Silva 2022). This storytelling skill is essential for gaining support, establishing credibility, evidencing impact, and articulating a vision for the future. Too often, however, we remain stuck with outmoded or irrelevant narratives that affect the way engineering is taught and practiced. What might happen if we equip more engineering students and educators with communication techniques that can help shift these common stories?

### **1.2 Why do engineers need storytelling skills?**

Storytelling has long been known to support meaning-making, enhance belonging, and foster community engagement (Simmons, 2006), and communication is essential to widely-recognized transferable skills such as collaboration, empathy, and creativity (Caratozzolo, Alvarez-Delgado, & Hosseini, 2020). Indeed, no matter what their role, engineers must be able to listen and integrate what they are hearing into their work, persuade and influence others to understand their positions and the value of sustainability choices, to work within and manage teams, and even to advocate for policies or a response to a policy. In many rhetorical situations, storytelling techniques can support effective communication outcomes (Suzuki et al., 2018). But the concept of storytelling as a communication technique for engineers is less often recognized, perhaps because this approach to communication is often

seen to be at odds with the cognitivist, distanced, impersonal style traditionally adopted within STEM fields (Miller, 1979).

Yet in recent years, storytelling has gained traction within engineering education. For instance, it has been studied in the context of Systems engineering and Creativity (Madni, 2015; Afkar et al. 2024) and standalone modules in storytelling have been offered within engineering degree programmes. Additionally, the growing recognition of the importance of multidisciplinary and integrated engineering education means that students, educators, and administrators alike need to be able to communicate the “why” of engineering: instead of focusing only on technical solutions and facts, they need to be able to connect problems to a broader context to ensure that solutions are relevant, understandable, ethical, and sustainable, which the emotional and personal side of storytelling can emphasize (Cortes Arevalo et al).

But this is not just a pedagogical fad or a new technique—it is a recognition of long-held indigenous knowledge: stories are powerful things (Lawrence & Paige, 2016). They shape our understanding of ourselves, of our communities, of our work; they can give us purpose, and they can lead us astray. Like anything else, engineering education is full of powerful established stories: about the stereotypes of engineers and engineering students, about the promise and peril of engineering innovations, about the silos we work in, about the slowness of institutions to change. These stories can be frustrating and limiting, but we find hope and opportunity in the perspective articulated by Canadian Cherokee writer Thomas King: “Want a different ethic? Tell a different story.” (2003, p. 164) Indeed, storytelling has been shown to motivate people to act and spark social change (Trevisan, Vaughan, & Vromen, 2025) and to compel agency around climate action (Wang & Coren, 2024). Through several years of radical collaboration, Engineering for One Planet, Engineers Without Borders UK, and the Engineering Professors Council are jointly trying to tell a different story about how resources to support educators can create meaningful impact and change within engineering education.

### **1.3 Resources and interventions to tell a new story**

Telling this new story, around the possibilities and opportunities inherent in redefining engineering excellence and educating engineers for a more globally responsible future, can be difficult and met with skepticism or more intransigent barriers. We’ve found incredible value in sharing resources, insights and experiences, and in learning from each other about shifting the narratives toward positive change in engineering education. We’ve also found that the EOP Framework, the EPC Toolkits, and the EWB UK Reimagined Degree Map support interventions at different levels of the engineering education system that can empower changemakers, show success is possible, convince others, and develop competencies within students and educators alike (Truslove, Hitt, & Crichton, 2024). Through engagements with students, we have found that the next generation of engineers is eager to learn more about how to articulate their passions and describe their desired impact.

In the case of communication,

- The Engineering for One Planet Framework and companion teaching guides articulate communication learning outcomes to strengthen a range of internal and external communication competencies, as well as self-reflection and leadership skills. From communicating the value and impact of sustainability choices effectively across disciplines, sectors, and hierarchies to managing projects and timelines to cultivating interpersonal skills, the tools provide specific examples and exercises that can be used in diverse classroom contexts.
- The EPC Ethics and Sustainability Toolkits provide guidance to educators not only about how to embed communication skills within engineering-focused learning activities, but also how to approach the challenges of leading tough discussions in the classroom, or how to have a conversation with someone who appears resistant to embedding sustainability within engineering curricula. Additionally, it showcases the stories of educators who have successfully implemented Toolkit activities to serve as a model for others.
- The EWB UK Reimagined Degree Map provides a step-by-step guide to reflect on the needs of modern learners, the approaches for contextualising 21st-century challenges within curricula and communicate strategic decisions with stakeholders around the need to change degrees. The Map can be used to strengthen ambition, relationships, and the various roles who contribute to navigating systemic change across a department(s). It is intended to facilitate engagement with a diverse group of people to shape degrees collaboratively, whilst providing content specifically aimed at educators for effective collaboration of programme adaptation and enhancement.

These resources were designed to inspire, motivate and support others. In this workshop, we will demonstrate how using them can help students and educators develop broader skills in communication, as well as contribute to a changing narrative of transformational engineering education (Buganza, 2023). Finally, we will showcase how these resources can connect users to a broader community that can help amplify the narrative of positive change.

## **2 WORKSHOP OBJECTIVES**

### **2.1 Target audience**

- Educators responsible for embedding communication or sustainability content in modules, programmes, or course content,
- Academic leaders involved in institutional strategy or future thinking,
- Those who seek to influence, gain traction, shift a culture or narrative, and communicate the impact of their work.

### **2.2 Expected learning outcomes**

In this highly interactive workshop, participants will be guided through small group activities and reflective plenary discussions. By the end of the session, participants will have:

- Learned how the resources mentioned above support communication outcomes within engineering;
- Become familiar with key components of effective storytelling;
- Practiced how to use a storytelling approach;
- Analyzed stories of change in engineering.

### 3 WORKSHOP DESIGN

#### 3.1 Time plan

The activities within this 60-minute workshop will connect people to ongoing resources and networks that support embedding communication in engineering education as part of globally responsible practice and communicating the case for change, whilst providing the space for participants to learn and practice storytelling skills.

*Table 1. Outline of Storytelling Workshop Timeline*

Run time	Activity and Facilitation Mode	Notes
15 min	Introduction: Didactic plenary	Communication outcomes in engineering, Existing resources for global responsibility, and Storytelling key techniques
15 min	Interactive activity 1: Work in small groups	Each group will analyze a change narrative based on either the EOP Framework, EPC Toolkits, or EWB UK Reimagined Degree Map to analyze the way the story was told and consider its relevance to their context.
7 min	Reflection and Discussion: Guided plenary	
15 min	Interactive activity 2: Work in pairs	Practice telling a story with those techniques
8 min	Takeaways and conclusions: Didactic Plenary	Learn how to connect to broader networks.

#### 3.2 Interactivity

The workshop will use several approaches to interactivity. Plenary sessions will use Socratic questioning, while Pair and Small Group work will allow participants to practice and analyze techniques presented in the didactic portions. Equally balanced between plenary, pair, and small group sessions, the workshop makes use of different learning modalities.

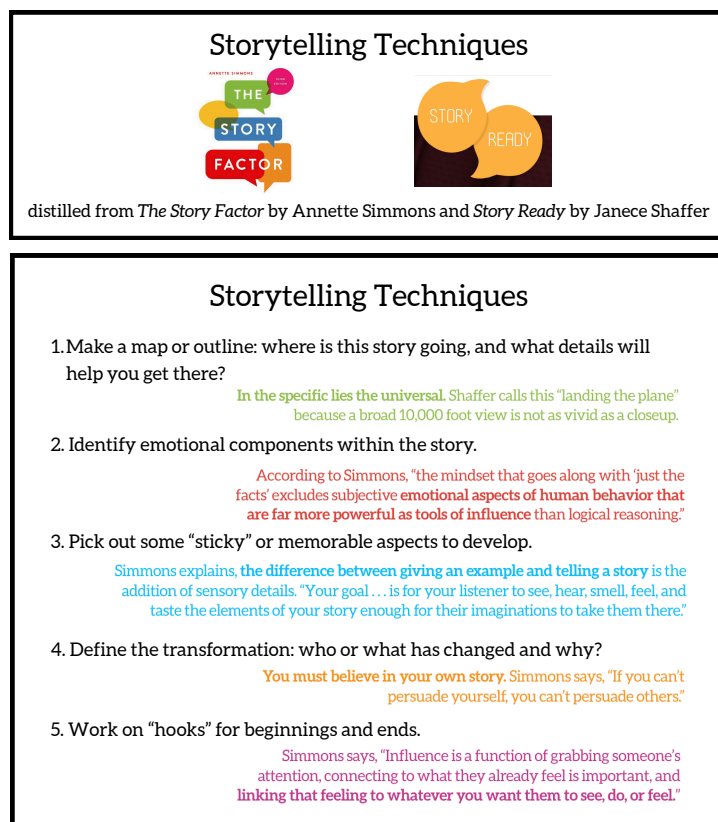
## 4 WORKSHOP RESULTS

Our aim was to demonstrate how the use of key storytelling skills among both students and educators can help shift entrenched narratives within engineering education by empowering people to communicate better and differently.

19 people attended the workshop, which was held during the first session of the first day of the conference. They broke into three groups for the first interactive session; each group was asked to analyse one of three different narratives:

1. “Of Ice Cream and Thermodynamics: The Power of Moments” by Dr. Adebayo (Bayo) Ogundipe, Grand Valley State University, Michigan USA
2. “Help! I’m Teaching Ethics for the First Time” by Jude Brampton, University of Bristol, UK
3. “Harnessing Opportunities for Change when Refreshing Courses” by Vicky Melon, Associate Head of the School of Engineering and Built Environment, Sheffield Hallam University, UK

They did this by using an accompanying handout seen in Figure 1. In the second



*Fig. 1* Storytelling Techniques

interactive session, attendees worked in pairs or trios on a story they wanted or needed to tell. At least four of the participants implemented learning from the workshop in their later conference sessions, and workshop facilitators were invited to support a potential Ethics Special Interest Group event related to this topic.

Finally, participants were provided with resources to support communication for globally responsible engineering, including the Engineering for One Planet Framework, the Reimagined Degree Map and Engineering for People Design Challenge from Engineers Without Borders – UK, and the Ethics and Sustainability Toolkits from the Engineering Professors Council.

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