



32nd Annual **INCOSYMP**
international symposium

hybrid event

Detroit, MI, USA
June 25 - 30, 2022

The left brain's search for its other half

The Soft Skills Challenge

www.incose.org/symp2022

“Sacred cows . . .



. . . make
gourmet
burgers!”

William Easum





Agenda

- What are soft skills?
- Why are they important?
- The soft skills gap
- The reasons why
- Closing the gap
- Conclusions





What are these soft skills?



Definition

Soft skills: “encompass personal, social, communication, and self-management behaviors.

They cover a wide spectrum of abilities and traits: being self-aware, trustworthiness, conscientiousness, adaptability, critical thinking, attitude, initiative, empathy, confidence, integrity, self-control, organizational awareness, likability, influence, risk taking, problem solving, leadership, time management, and then some.”

Peggy Klaus, *The Hard Truth About Soft Skills*



Definitions

- "A measurable pattern of knowledge, skills, abilities, behaviors, and other characteristics that an individual needs to perform work roles or occupational functions successfully. Competencies specify the "how" of performing job tasks, or what the person needs to do the job successfully." (U.S. OPM 2022)
- "A measure of an individual's ability in terms of their knowledge, skills, and behavior to perform a given role." (Holt & Perry 2011)



Soft skills – List (representative)

- Communication
- Time management
- Teamwork
- Creativity
- Innovation
- Adaptability
- Etc.





Soft skills by category

COOPERATION/COLLABORATION

Communication
Facilitation
Conflict management
Team dynamics
Emotional intelligence

PERSONAL RESPONSIBILITY

Dependability
Work ethic
Positivity

THINKING SKILLS

Creativity
Problem solving
Critical thinking
Systems thinking



Soft skills draw on other knowledge

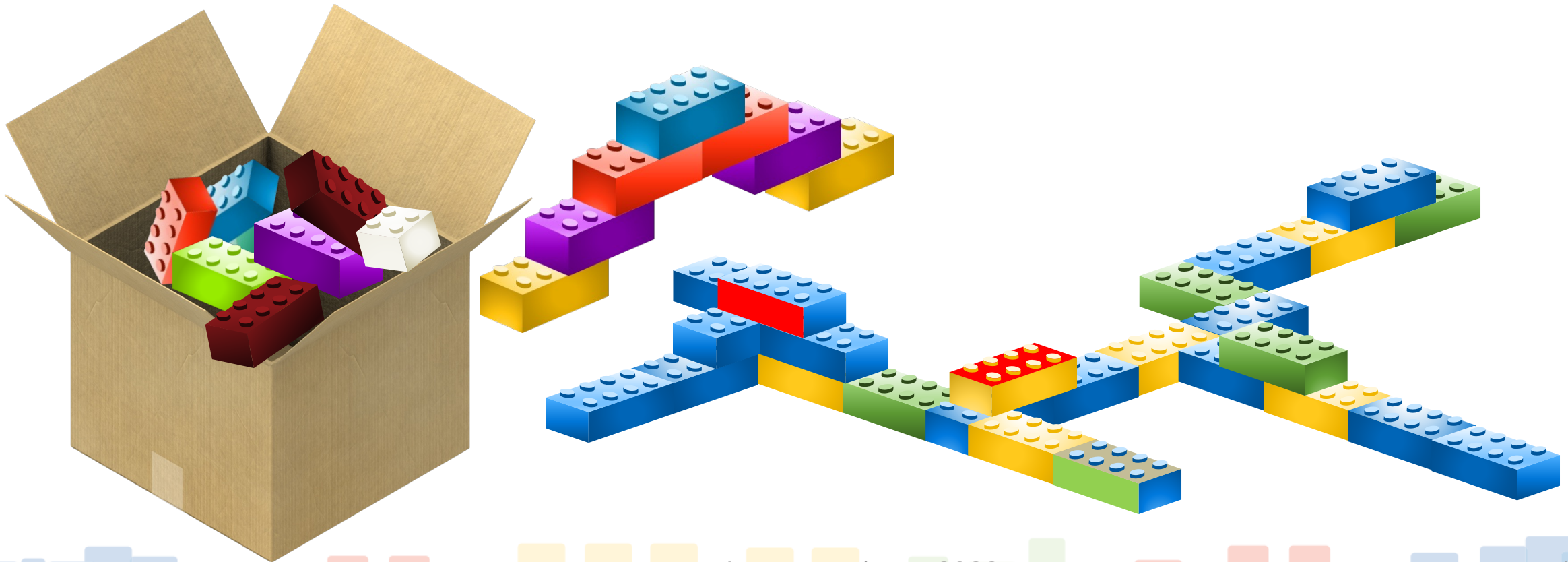
- Direct training in the skills themselves
 - Communication
 - Facilitation
 - Systems thinking
- Supplying the material for exercising the skills



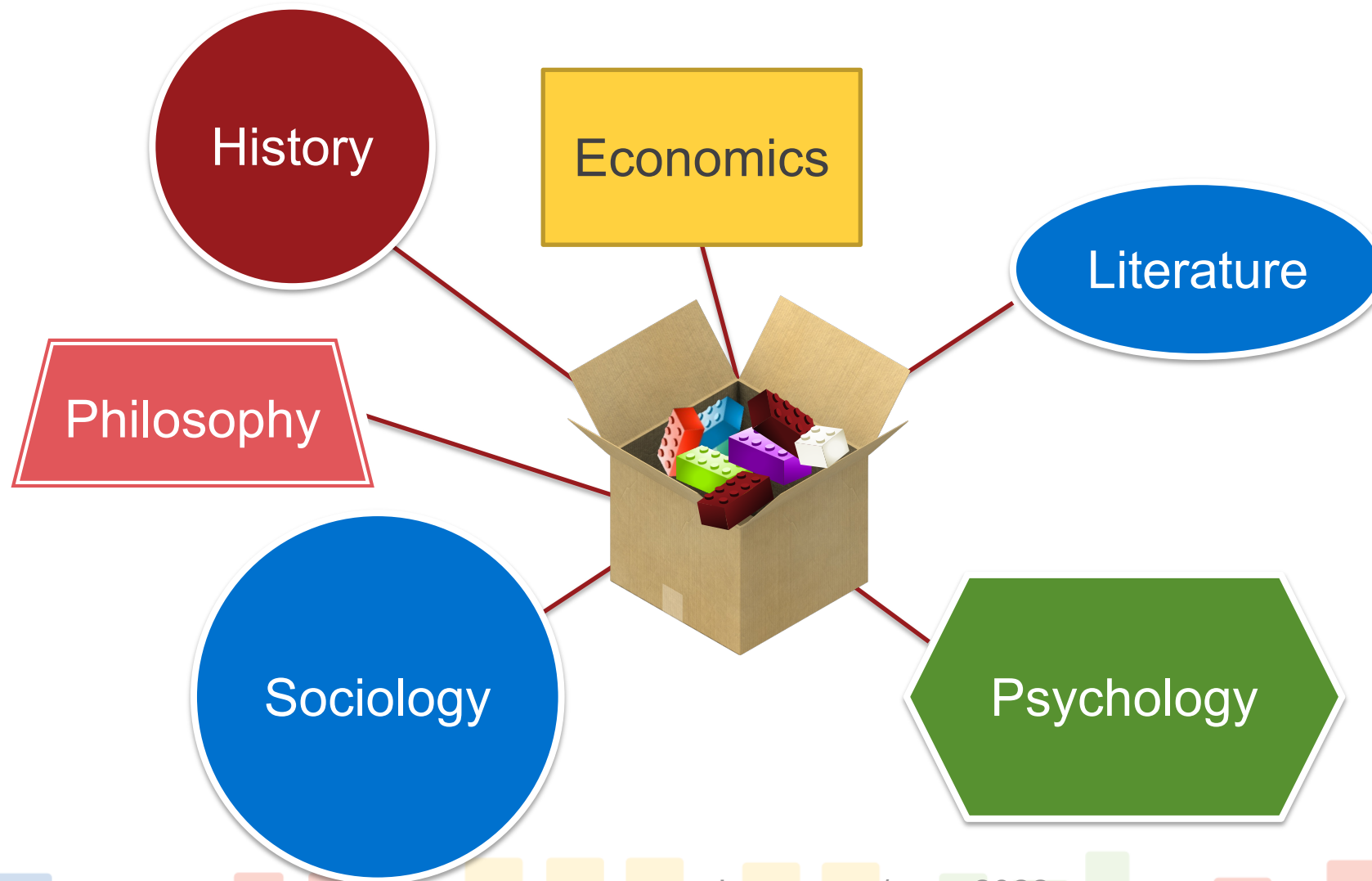
Example: Creativity – Combinatorial play



The variety and number of building blocks in your collection controls the number of possible solutions you can construct



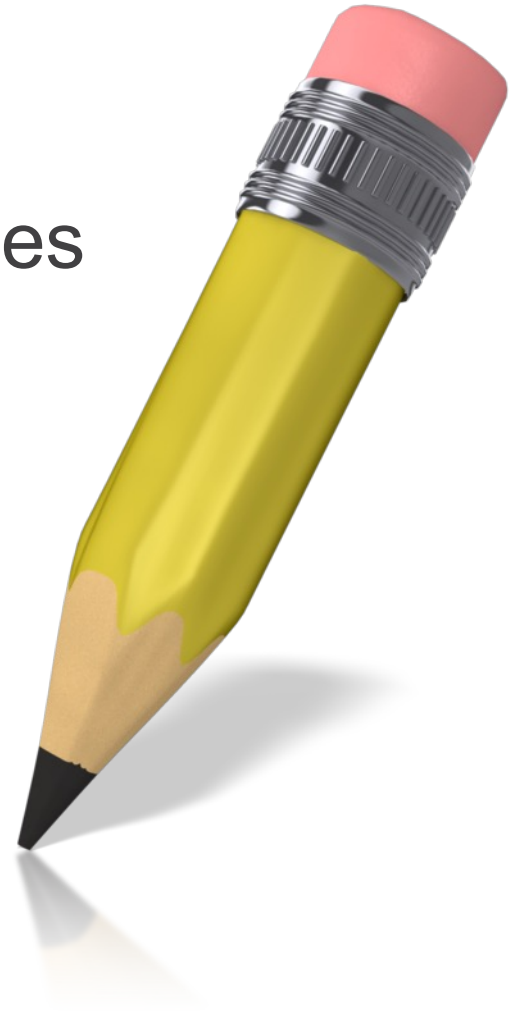
Example: Creativity – Combinatorial play





What's the point?

- Hard to define
- Cover a wide range of knowledge, skills and abilities
- Can be hard to measure
- Often neglected
- “(F)or the most part, people think soft skills don't really matter and are confused over exactly what they are.” – Peggy Klaus
- “No such thing” Simon Sinek





Important note!

- We think of soft skills as “people” skills
 - Communication, leadership, influence persuasion, negotiation etc.
- But . . . soft skills also include “world interface” skills
 - Creativity, innovation, social consciousness, organizational awareness etc.
- And workforce interface skills
 - Work ethic, reliability, team mindset etc.
- **This broadens the educational preparation task!**



Relational skills that make for better leaders and better team members

Importance of soft skills



Importance in the workplace

- Long recognized
 - 1918 study (A Study of Engineering Education, Mann, C. R.)
 - 75% job success attributed to soft skills, 25% to technical
- 2017 study by Deloitte in Australia
 - “Soft skill intensive” jobs will grow 2.5x faster than others making nearly 2/3 of all Australian jobs soft skill intensive by 2030
- 2021 study showing the exercise of emotional intelligence by supervisors enhances work environment raising employees’ creativity at work
- 2018 McKinsey study of skill shifts across all U.S. industries due to advancing technology shows 26% increase in the demand for emotional and social skills while demand for higher cognitive skills will increase 19%. The corresponding growth in Europe is projected to be 22% and 14% respectively.



Social sciences and the engineer

- “To manage the complexity, an understanding of social science concepts can aid the systems engineer in the successful development or operation of a system.”
Palmer et al
- Impacting three types of systems engineering applications:
 - Discipline integration – “large social endeavor”
 - System social influences
 - Social sciences



The soft skills gap



We lack the skills themselves

- Communication (oral, written, graphical)
- Negotiation
- Conflict management

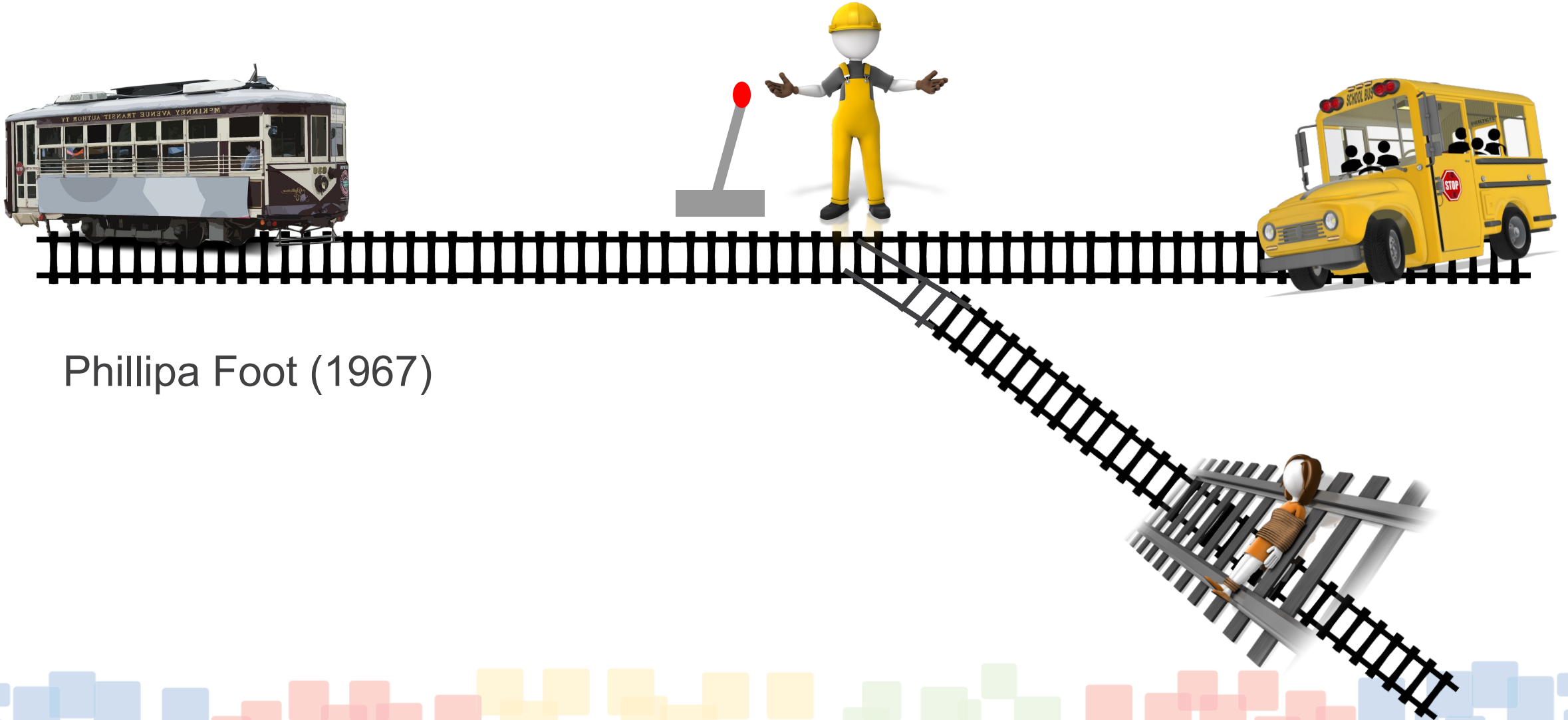




We lack the supporting knowledge

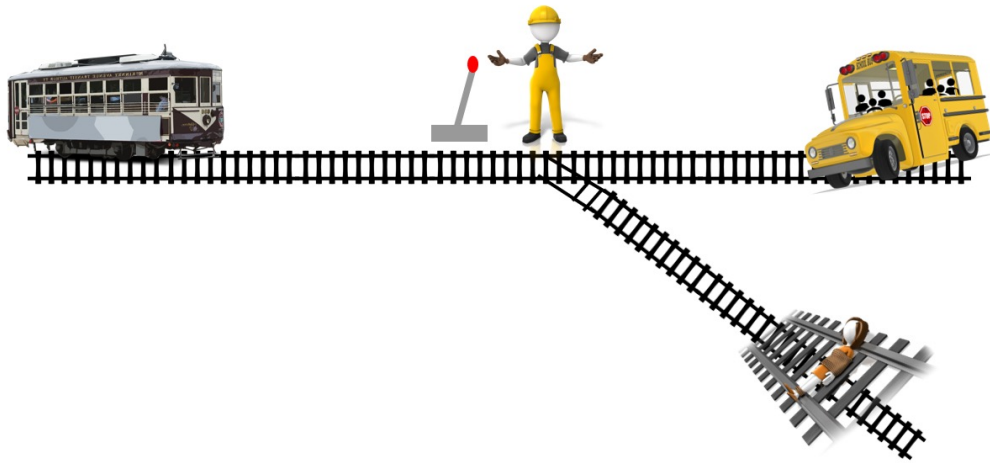
- Social sciences
 - history, geography, political science, economics, psychology, sociology etc.
- Humanities
 - languages, literature, philosophy, archaeology, anthropology, human geography, law, religion, and art

Anecdotal Example: The “Trolley Problem”



Phillipa Foot (1967)

The “Trolley Problem” – What don’t we know?



- Utilitarianism - consequences v. intent
- Many versus one, greater good
- Action versus inaction
- Who is to blame – algorithm v. human

Moral philosophy:

What it is, what it has to say, how it can help us



The reasons why



Where do (should) soft skills come from?

- Education
 - Direct training
 - Communication, negotiation, problem-solving, leadership
 - Higher cognitive skills
 - Fed by social sciences / humanities
 - Creativity, critical thinking, systems thinking



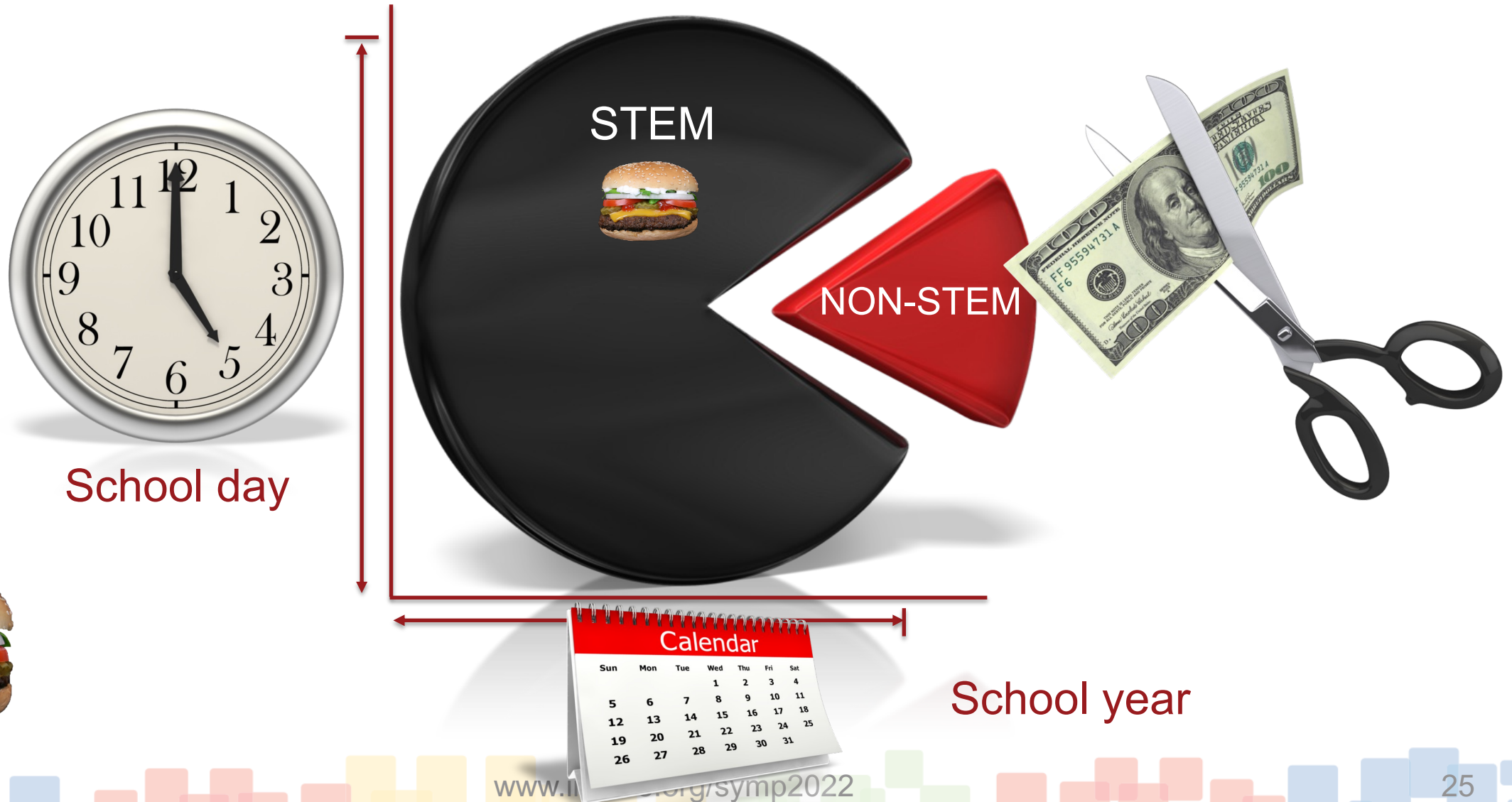
Why don't they?

- Societal attitudes
 - Pejorative name (soft)
- Educational policy
 - “Space/arms race”; technical gap
 - STEM emphasis
- Public policy
 - funding





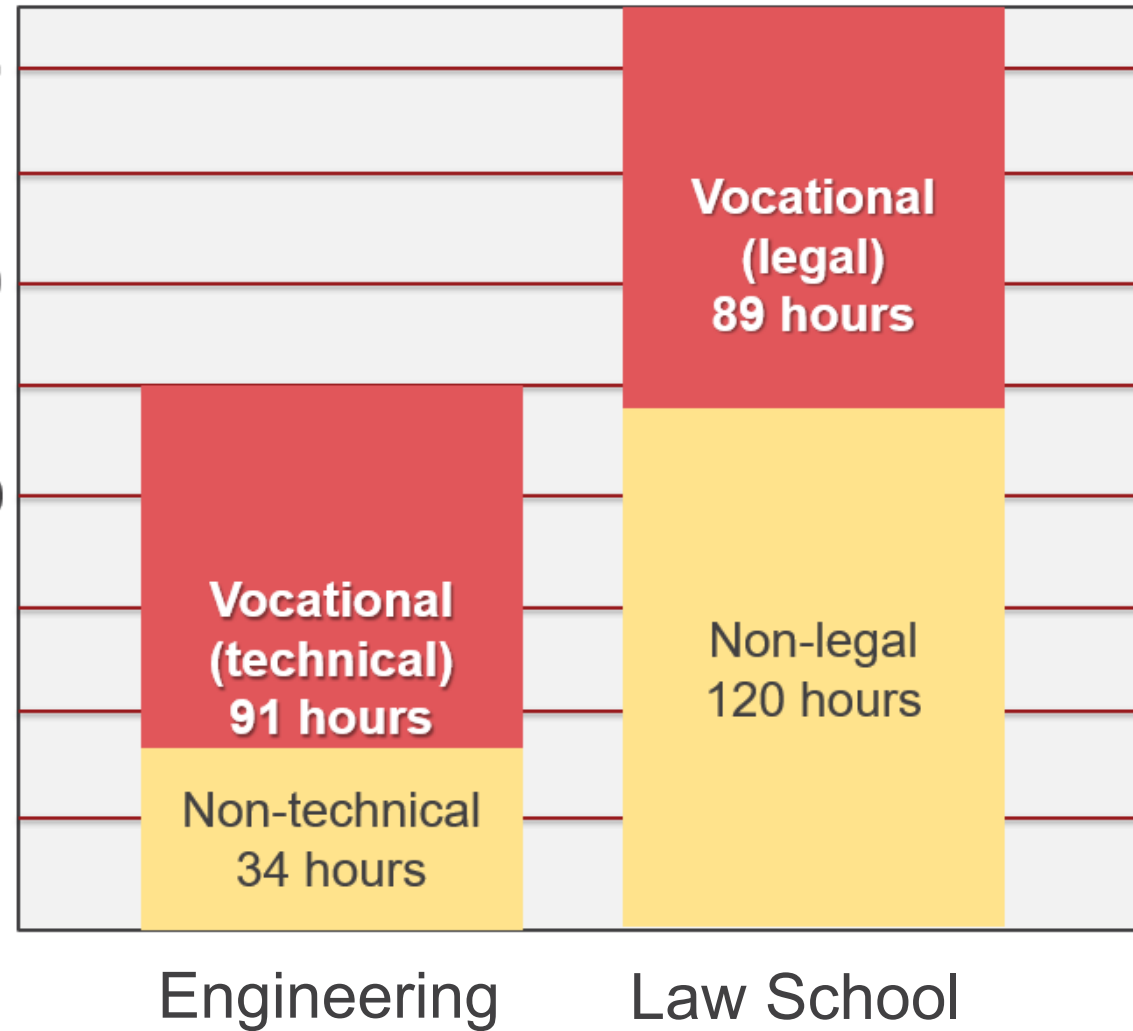
STEM: A constrained solution



Educational disparity



Semester
Hours





Closing the gap





What can we do?

- Societal attitudes
- Public policy
- Pre-K – Secondary education
- Post secondary / professional education
- Workforce training
- Give the gap as much attention as we did the technical gap

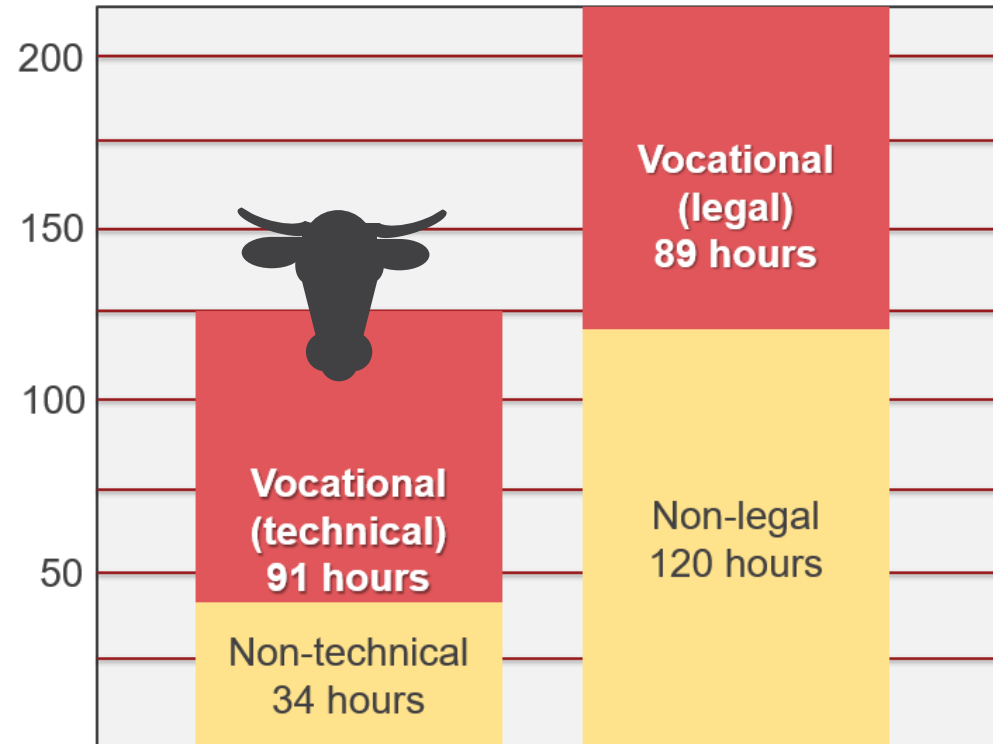
STEM v. STEAM – Eating the burgers!



INCOSE SySTEM initiative becomes SySTEAM



“Putting the ‘A’ in SySTEAM is a way for us to tell our community and the rest of the world that we see the arts and humanities as being just as important as the sciences, and that we’ve embraced that perspective in our efforts.”



That is good, but what does it mean for K-12, post-secondary and workforce training?



Conclusions



Problem and solutions

- Attitudinal shifts
- Policy shifts – priorities
- Commitment – parents, schools, employers
- Investment – education, industry
- Give the gap as much attention as we did the technical gap



Resources

Resources



- Epstein, D, Range: *Why Generalists Triumph in a Specialized World*
- Glassdoor, 2021, 'How to Identify and Develop Soft Skills',
<https://www.glassdoor.com/blog/guide/develop-soft-skills/>
- Hirsch, E, *Cultural Literacy: What Every American Needs to Know*
- Klaus, P 2008, *The Hard Truth About Soft Skills: Workplace Lessons Smart People Wish They'd Learned Sooner*
- Nichols, T 2018, *The Death of Expertise: The Campaign against Established Knowledge and Why it Matters*
- Palmer et al, *Putting the Social in Systems Engineering: An Overview and Conceptual Development, INCOSE IS 2021*
- Pink, D, *A Whole New Mind: Moving from the Information Age to the Conceptual Age*
- Young, J 1939, *A Technique for Producing Ideas*

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Thank You!

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