

This work is licenced under an Attribution-NonCommercial-ShareAlike Licence

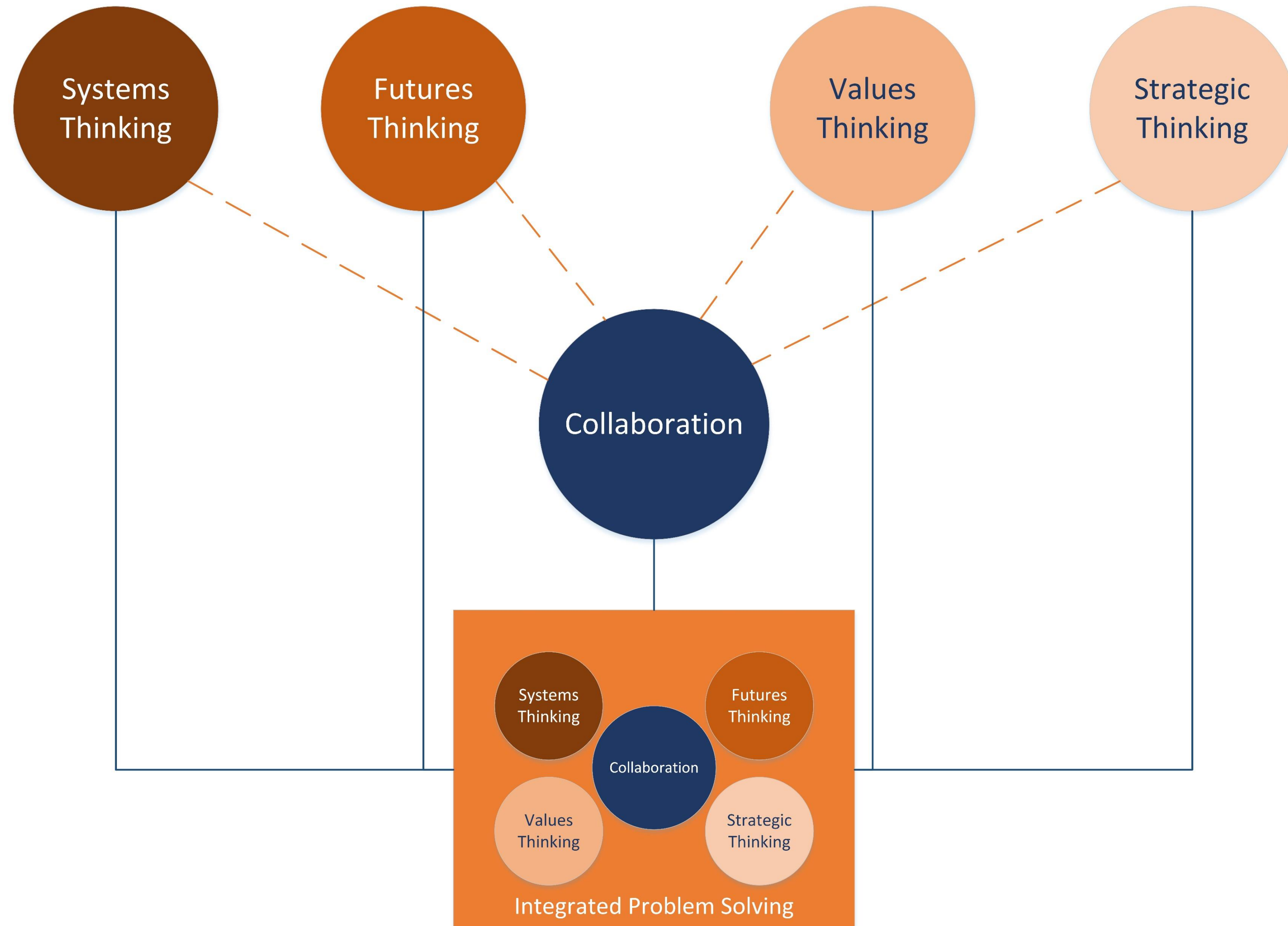


# Spaceship Earth: the Blue Marble





# 6 Key competencies sustainability



# Inner Development Goals: 5 dimensions

- 1 **Being** — Relationship to Self
- 2 **Thinking** — Cognitive Skills
- 3 **Relating** — Caring for Others and the World
- 4 **Collaborating** — Social Skills
- 5 **Acting** — Enabling Change

*Source: [www.innerdevelopmentgoals.org](http://www.innerdevelopmentgoals.org)*



# Inner Development Goals: 23 skills and qualities



# How to teach and learn?

- Real-life group projects with stakeholders
- Reflective practice and self-assessment
- Internships
- Extracurricular activities
- Mentoring and networks
- Personal development resources

# Project Education vs Challenge-Based Learning

Capstone project education	Challenge-based learning
Engineering	Engineering, business, society
Product context	Societal context
Known problem, unknown solutions	Unknown problem, unknown solutions
Fundamentals	Fundamentals, range, tools
Mono- and multidisciplinary	Inter- and transdisciplinary
Integrative	Holistic
Customer needs	Value driven
Teamwork	Teamwork and individual
Coach and student	Co-learners, together with stakeholders
Academically interesting	Authentic real life, positive societal impact

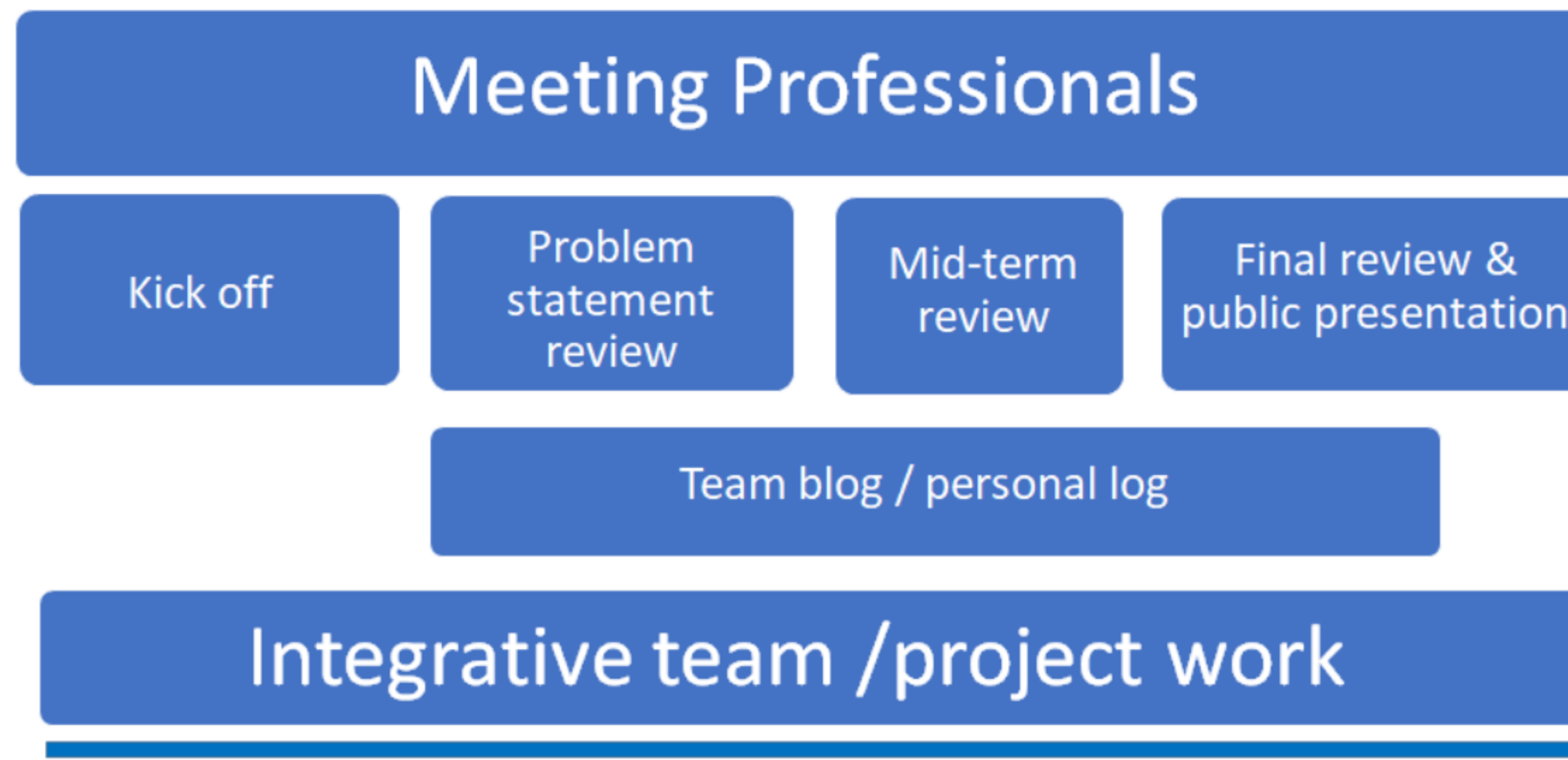
*Adapted from Comparative Analysis of Challenge-Based Learning Experiences. Malmqvist, et al. (2015)*



# TU Delft Joint Interdisciplinary Project

Authentic sustainable innovation projects

[www.jointinterdisciplinaryproject.nl](http://www.jointinterdisciplinaryproject.nl)



- 'SMART' Intended Learning Outcomes
- Circular assessment, blogs, reflection
- Courage of Education Management, Administration, Board of Examiners
- Staff: 'What's in it for me?'



# Shift in stakeholder's wishes and needs

- Systems, product and services to be:

Simple

Safe

Secure

Smart

Stable & predictable

Maintainable

Socially acceptable/Sustainable

Affordable

Scalable

Adaptable

# In the age of AI

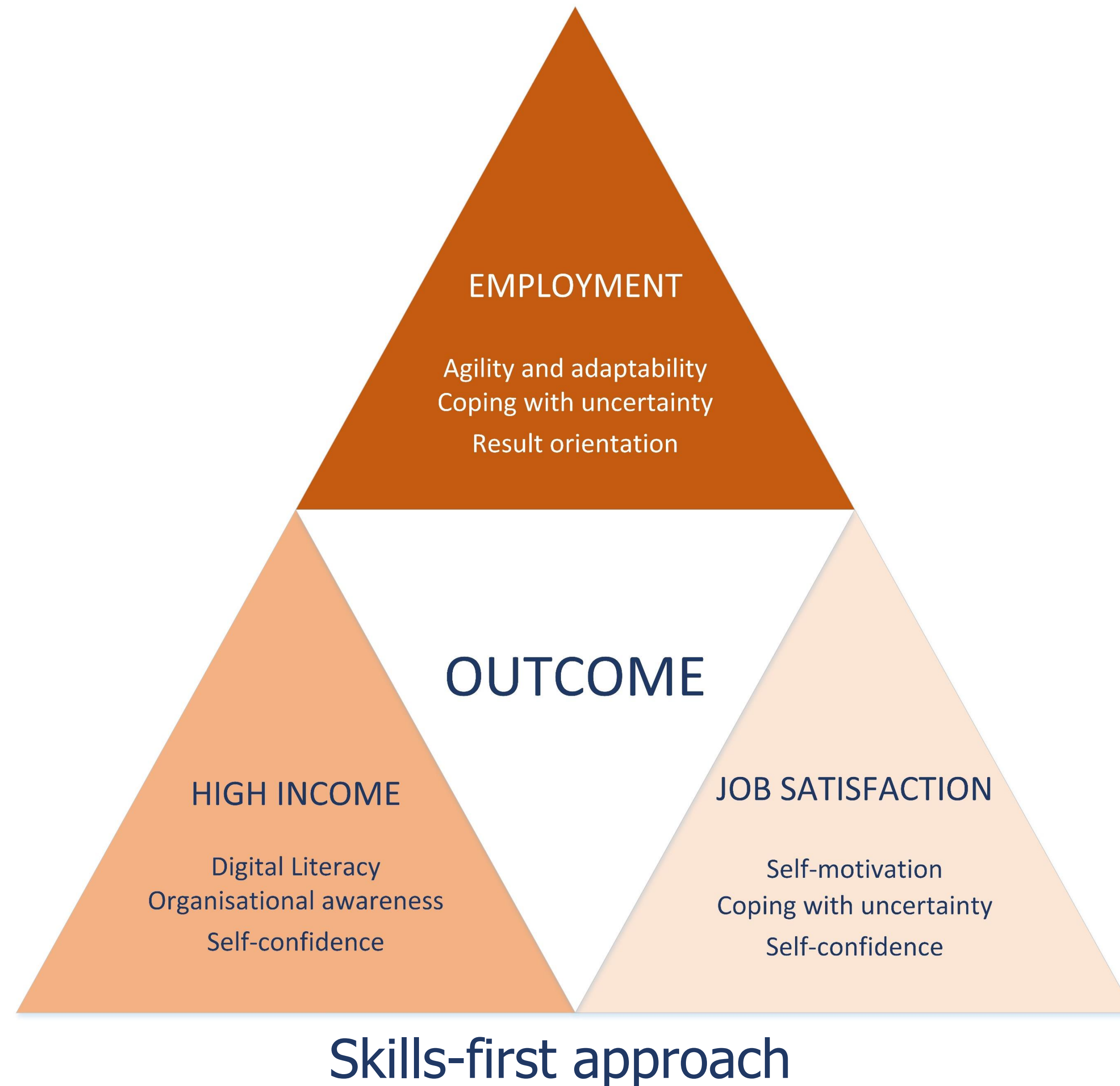
*We've known since Star Wars that intelligent machines can  
easily do an engineer's work.*

*'The droids are on the verge'*

*It's time to focus our education on what human engineers  
can do better than AI*



# Competence proficiency outcomes

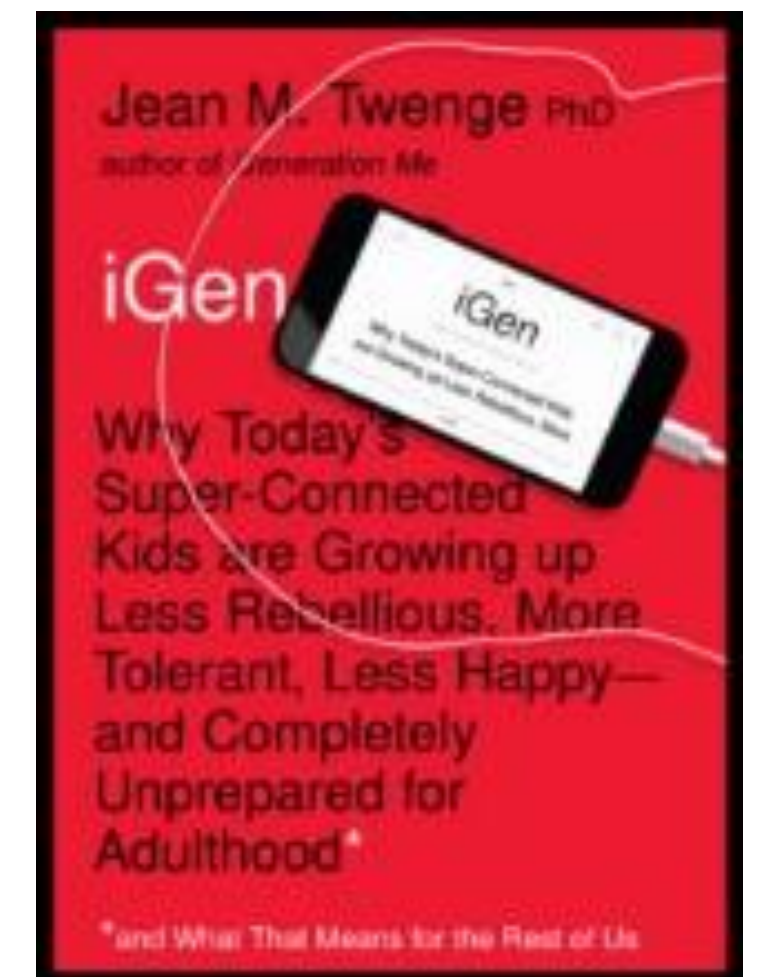


Source: McKinsey (2021) Future citizen skills

# Breed of Gen-Z students

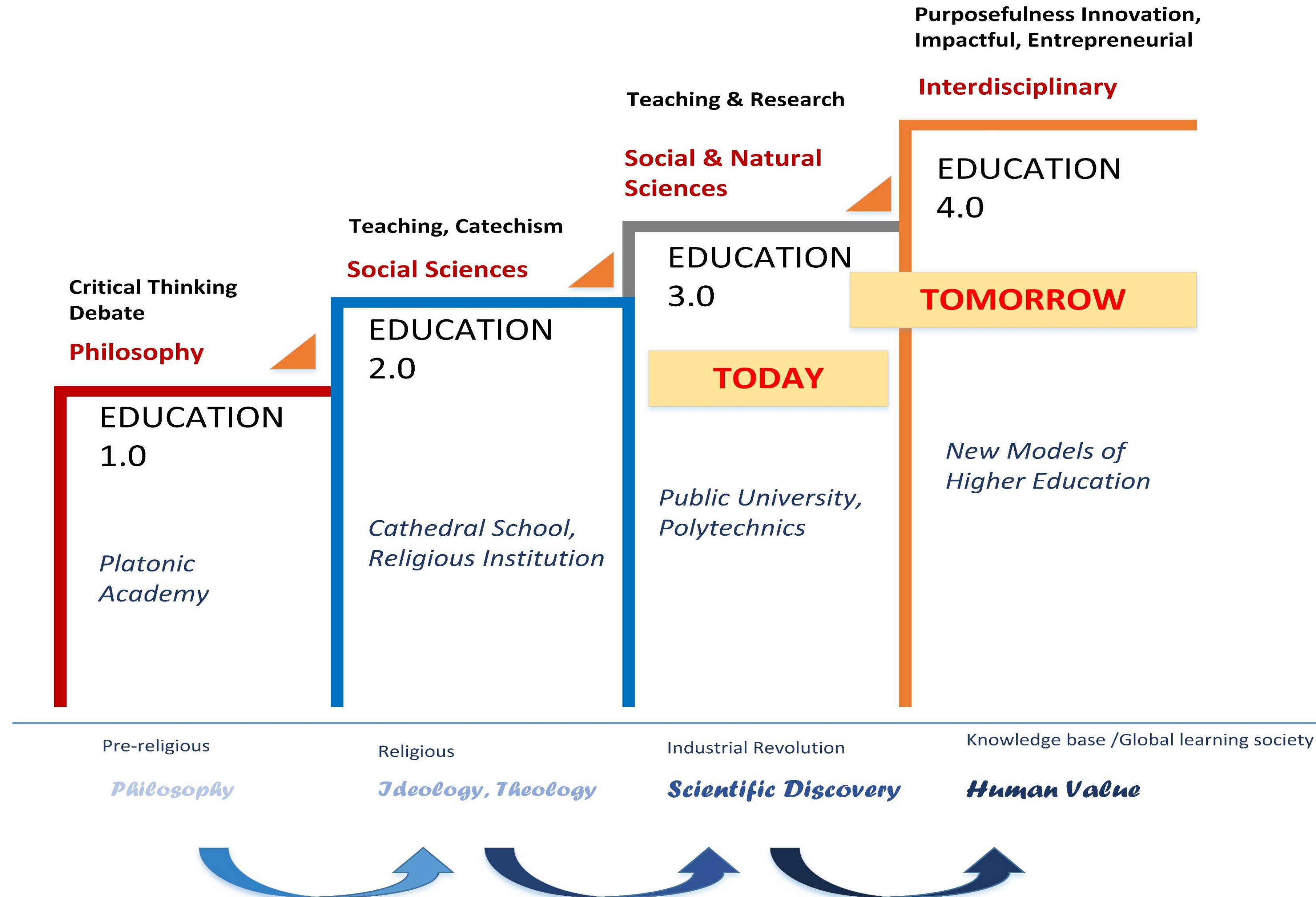
- *Digital natives*
- Technically connected, *disconnected* from human relationships
- Smartphone addicted
- *Younger, uncertain, vulnerable*
  - Need more guidance and personal development
  - Take more time to grow up to adulthood
  - Less familiar with norms and expectations
  - Empowered but scared of oral communication
- *Self-directed for individual identity*
  - Distinctive CV
  - Build-it-yourself careers
  - Strong in purpose (relevance, real life)
- *Instant culture*

Source: YoungWorks,  
Understanding GenZ,  
Amsterdam 2023



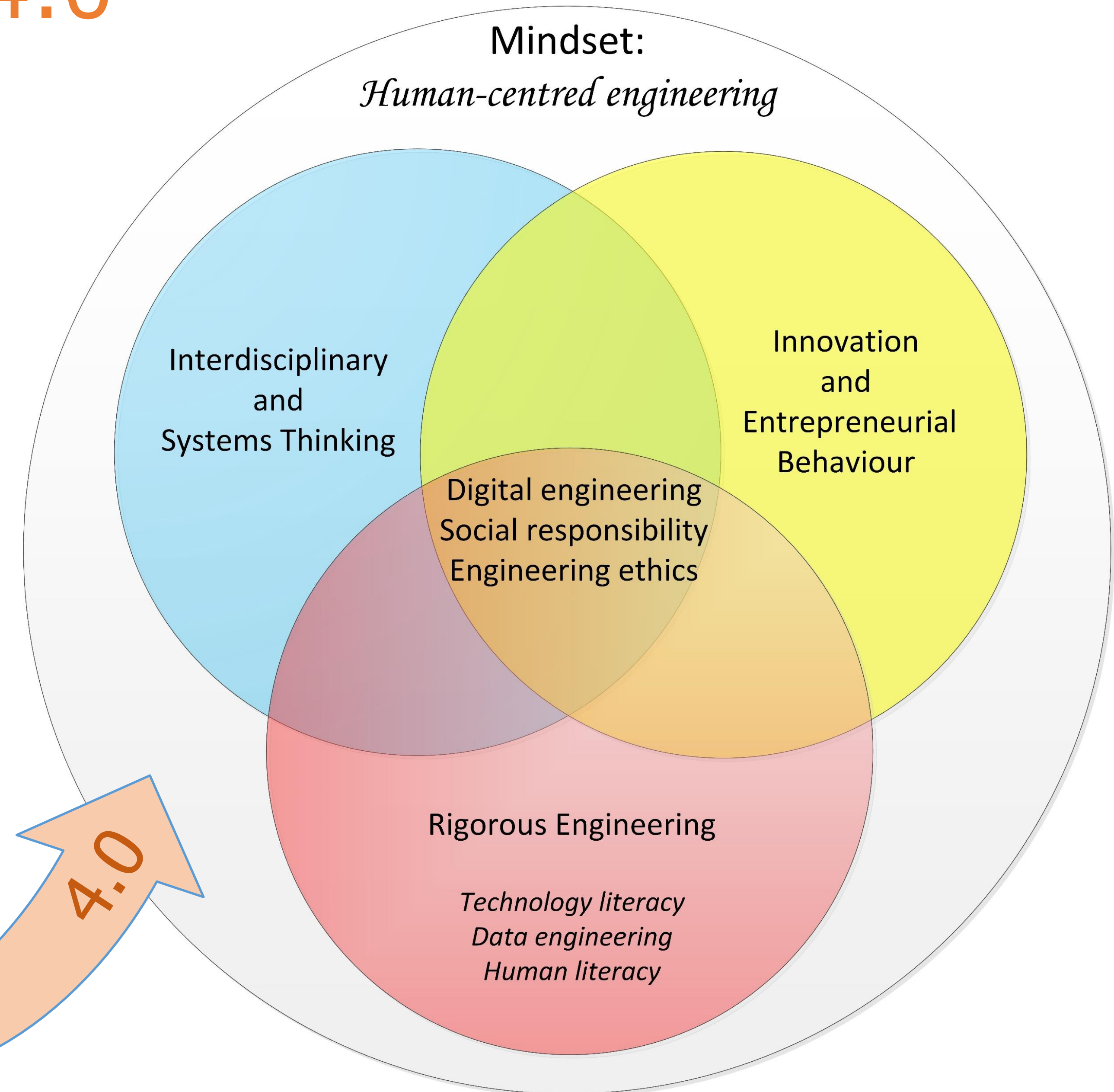
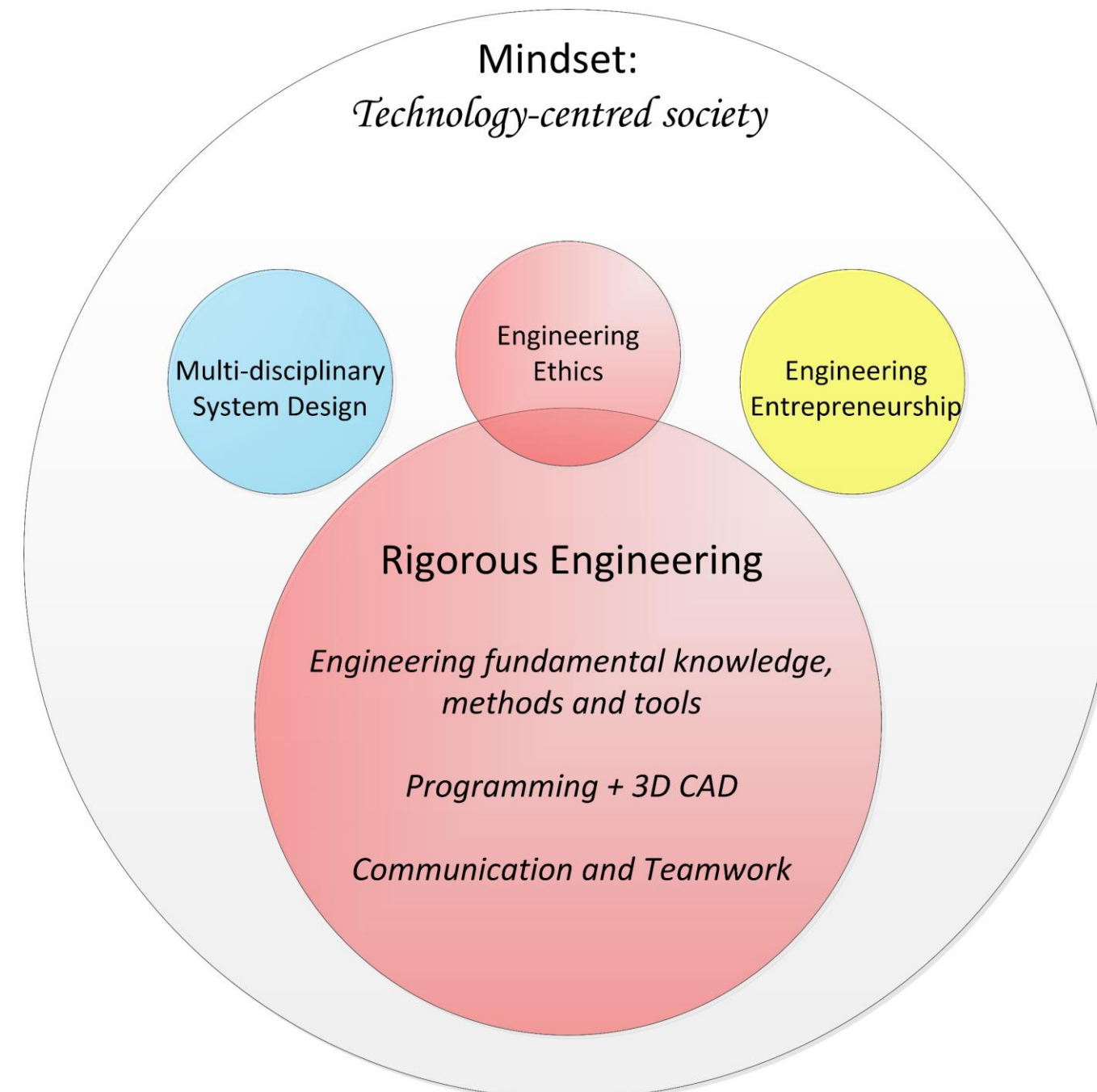


# Paradigm shift in university education



Adapted from: CDIO International Conference 2021  
 keynote Dr Pailin; Chuchottaworn (VISTEC/KVIS)

# S&T Education 4.0



4.0



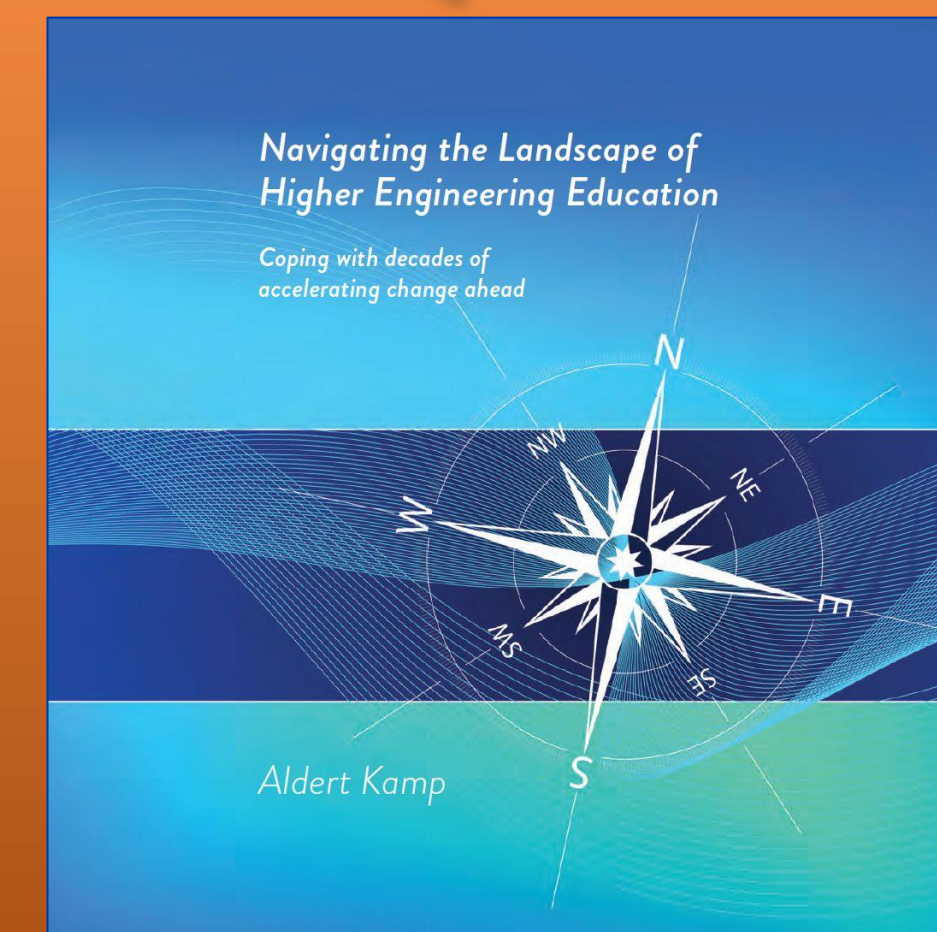
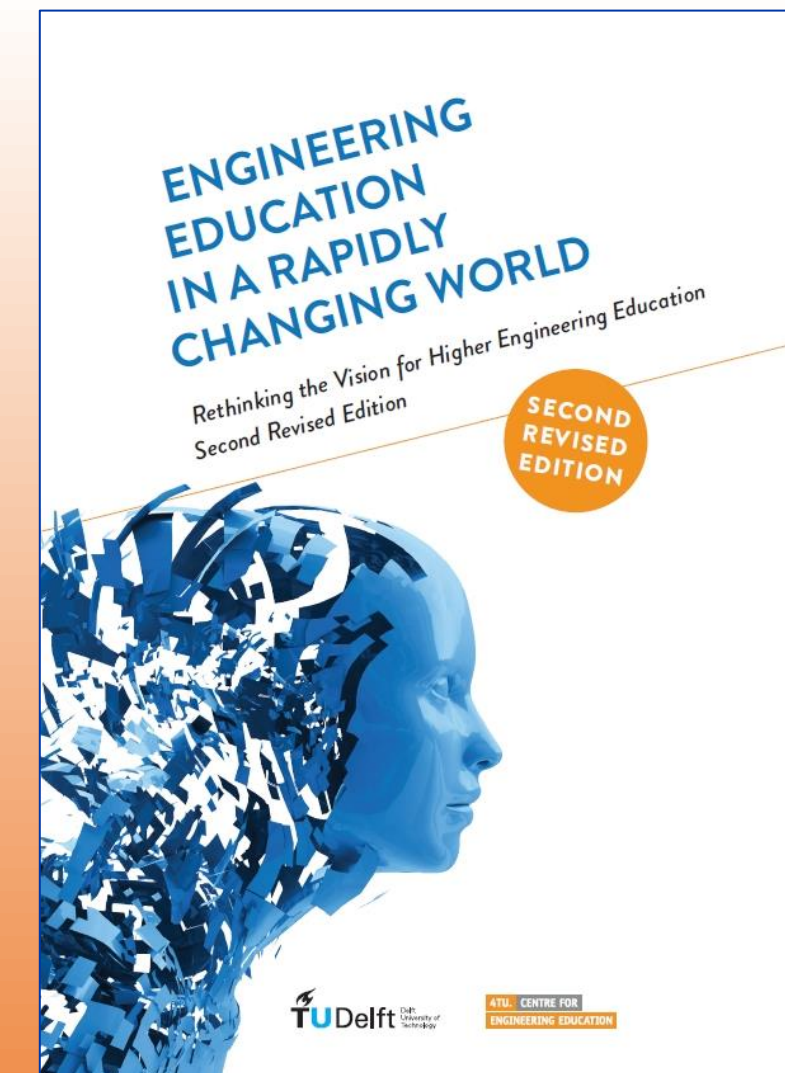
# Takeaways

- **SKILLS-FIRST APPROACH IN HIGHER EDUCATION FOR SUSTAINABILITY**
- **TWO FRAMEWORKS**
  1. Systems Thinking, Futures Thinking, Strategic Thinking, Value Thinking, Collaboration, Integrated Problem Solving
  2. Being, Thinking, Relating, Collaborating, Acting
- **CHALLENGE-BASED LEARNING** as promising concept
- **PARADIGM SHIFTS**
  1. From a Technology-centred Society → Human-centred Engineering
  2. From Scientific Discovery → Human Value
- **HOMO FLORENS**, the flourishing human

# Read more about future higher education

[www.aldertkamp.nl](http://www.aldertkamp.nl)

- Free downloadable books
- Keynote video recordings
- PowerPoints (some with voice-over)
- Reports
- Papers
- Blogs



Email: [me@aldertkamp.nl](mailto:me@aldertkamp.nl)

