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# Industry – Academia – Government Collaboration for **Workforce Expertise Development**

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Director

**ITS Global Engagement**

Thursday 9 December 2021

**Global Technology Initiative (GTI) Consortium**



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Surabaya - Indonesia



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# Nurturing the Future Generation:

**A Burden** or **A Privilege**





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# The world we are living now

VUCA

Volatile

The environment demands you react quickly to ongoing changes that are unpredictable and out of your control

Uncertain

The environment requires you to take action without certainty

Complex

The environment is dynamic, with many interdependencies

Ambiguous

The environment is unfamiliar, outside of your expertise

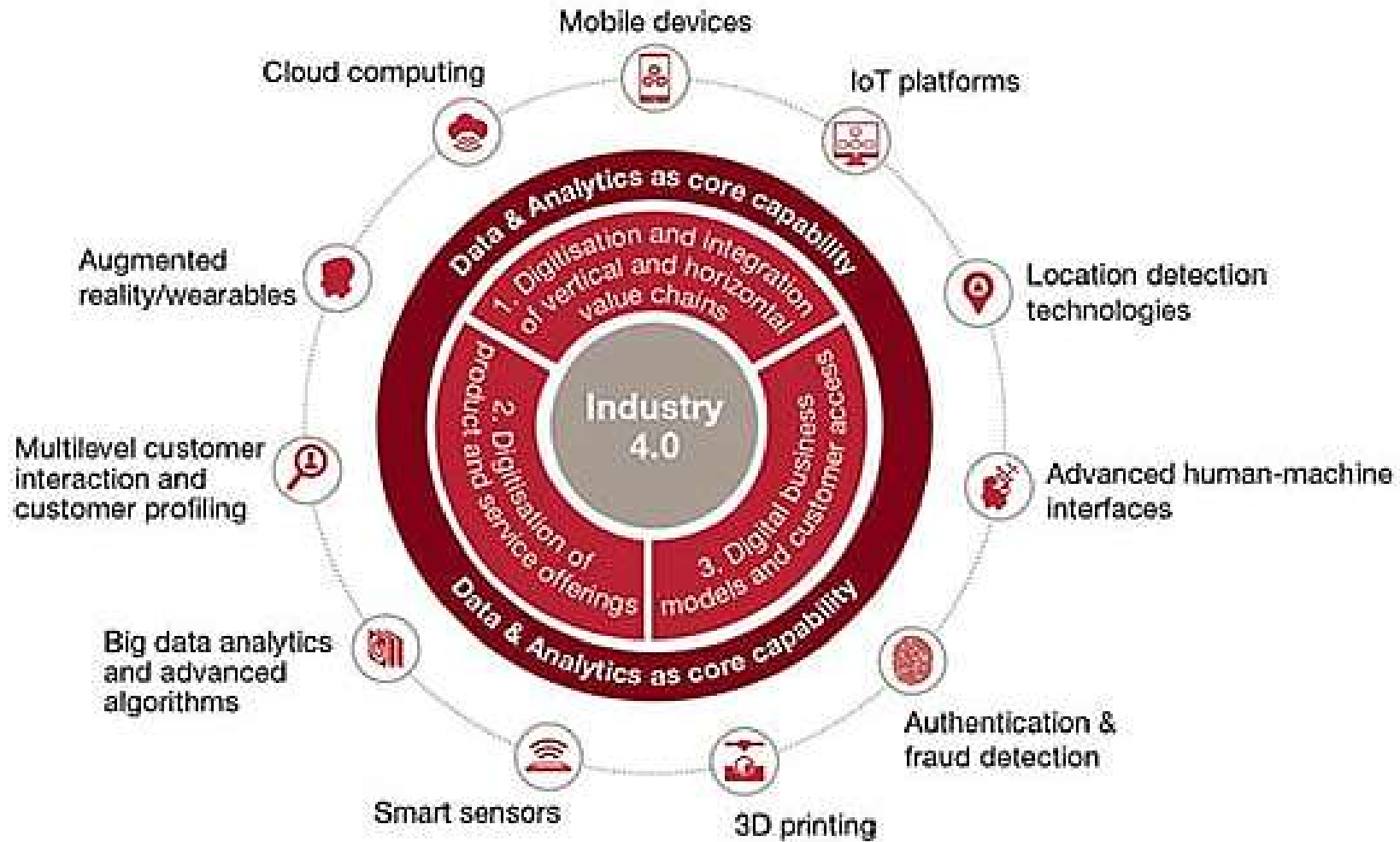
Sources:

<https://www.advuca.com/post/what-are-the-characteristics-of-the-vuca-world-including-the-current-sanitary-crisis>

[https://static.wixstatic.com/media/b59703\\_d9d08e99893845429d53fbcee257db8e~mv2.png/v1/fill/w\\_740,h\\_414,al\\_c,q\\_95/b59703\\_d9d08e99893845429d53fbcee257db8e~mv2.webp](https://static.wixstatic.com/media/b59703_d9d08e99893845429d53fbcee257db8e~mv2.png/v1/fill/w_740,h_414,al_c,q_95/b59703_d9d08e99893845429d53fbcee257db8e~mv2.webp)



# Industrial Revolution 4.0



Source: <https://pbs.twimg.com/media/C3gr4mcWcAE-FKT?format=jpg&name=large>





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# 21<sup>st</sup> Century Skills



Source: <https://www.weforum.org/reports/the-future-of-jobs-report-2020>





# The Future of Jobs Report 2020

- The pace of technology adoption is expected to remain unabated and may accelerate in some areas.

- Automation, in tandem with the COVID-19 recession, is creating a 'double-disruption' scenario for workers.

- Although the number of jobs destroyed will be surpassed by the number of 'jobs of tomorrow' created, in contrast to previous years, job creation is slowing while job destruction accelerates.
- The public sector needs to provide stronger support for reskilling and upskilling for at-risk or displaced workers.

- Skills gaps continue to be high as in-demand skills across jobs change in the next five years. The top skills and skill groups which employers see as rising in prominence in the lead up to 2025 include groups such as critical thinking and analysis as well as problem-solving, and skills in self-management such as active learning, resilience, stress tolerance and flexibility. On average, companies estimate that around 40% of workers will require reskilling of six months or less and 94% of business leaders report that they expect employees to pick up new skills on the job, a sharp uptake from 65% in 2018.

- Companies need to invest in better metrics of human and social capital through adoption of environmental, social and governance (ESG) metrics and matched with renewed measures of human capital accounting. A significant number of business leaders understand that reskilling employees, particularly in industry coalitions and in public-private collaborations, is both cost-effective and has significant mid- to long-term dividends—not only for their enterprise but also for the benefit of society more broadly. Companies hope to internally redeploy nearly 50% of workers displaced by technological automation and augmentation, as opposed to making wider use of layoffs and automation-based labour savings as a core workforce strategy.

- In the absence of proactive efforts, inequality is likely to be exacerbated by the dual impact of technology and the pandemic recession.





- The window of opportunity to reskill and upskill workers has become shorter in the newly constrained labour market.

- Despite the current economic downturn, the large majority of employers recognize the value of human capital investment.

# Top 10 skills of 2025

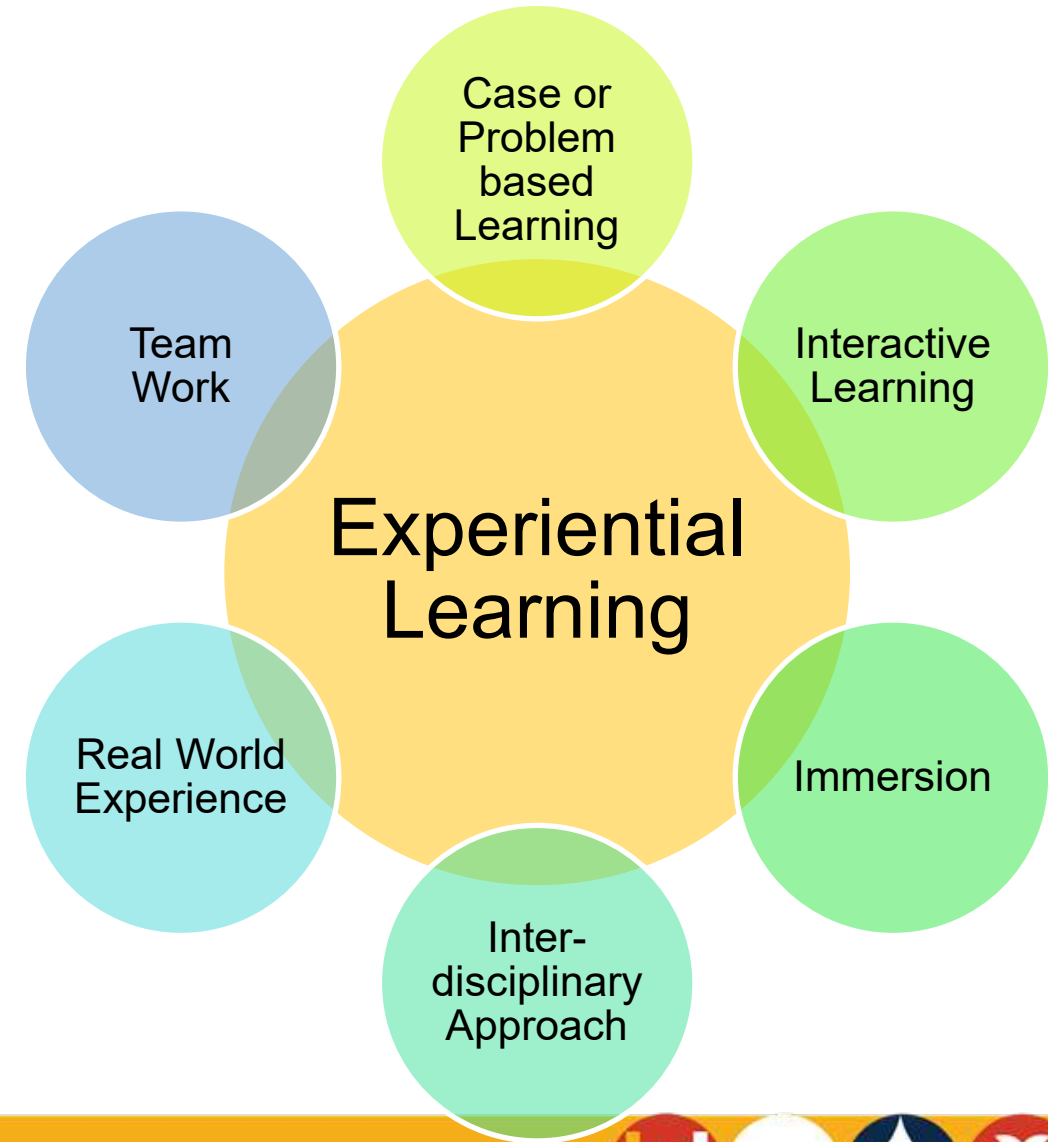
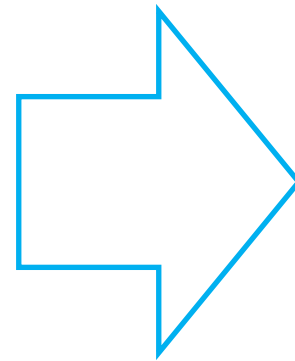
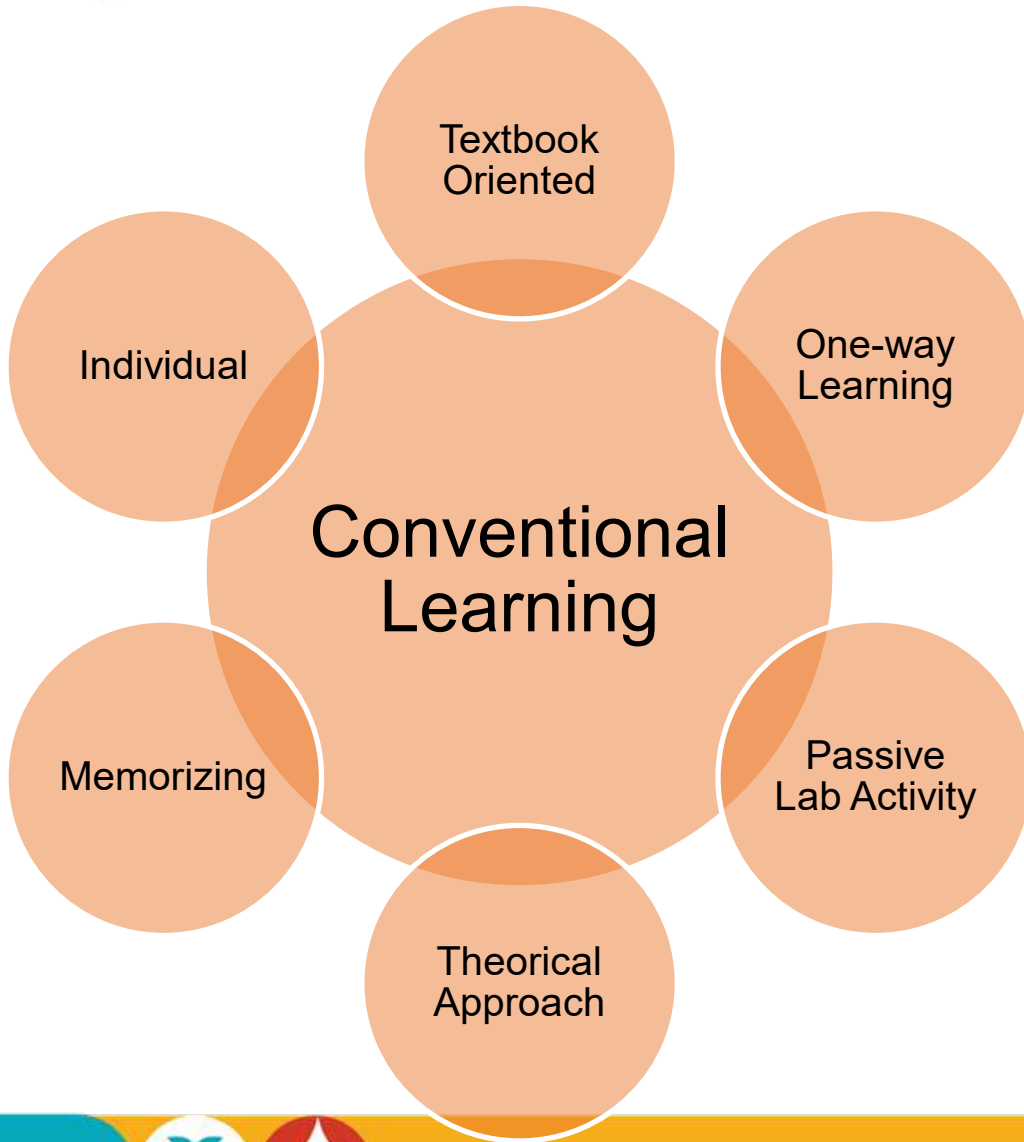
-  Analytical thinking and innovation
-  Active learning and learning strategies
-  Complex problem-solving
-  Critical thinking and analysis
-  Creativity, originality and initiative
-  Leadership and social influence
-  Technology use, monitoring and control
-  Technology design and programming
-  Resilience, stress tolerance and flexibility
-  Reasoning, problem-solving and ideation

## Type of skill

-  Problem-solving
-  Self-management
-  Working with people
-  Technology use and development

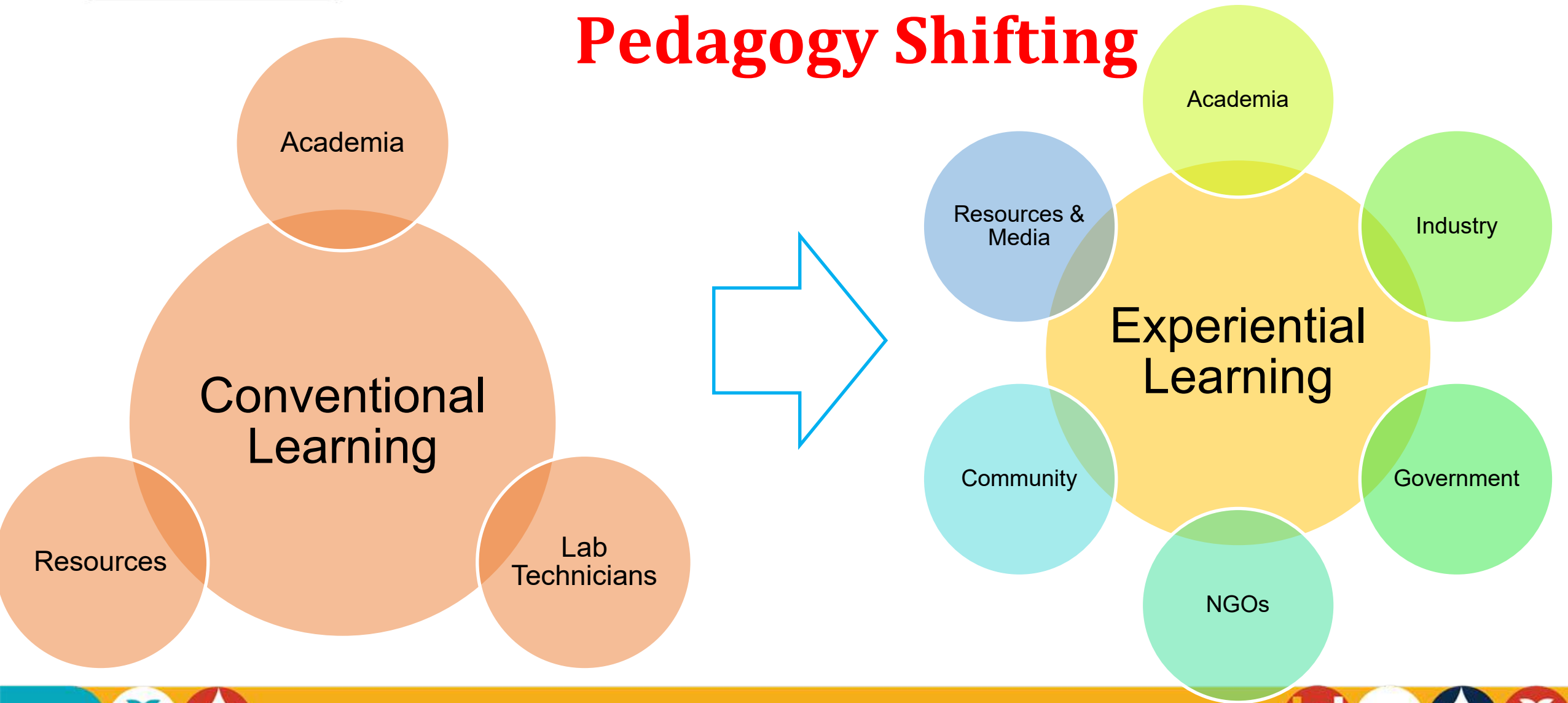


# Required Pedagogy Shifting





# Required Stakeholders in Pedagogy Shifting



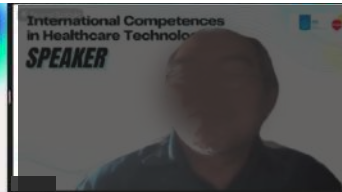
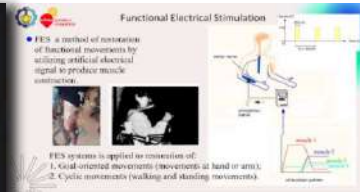
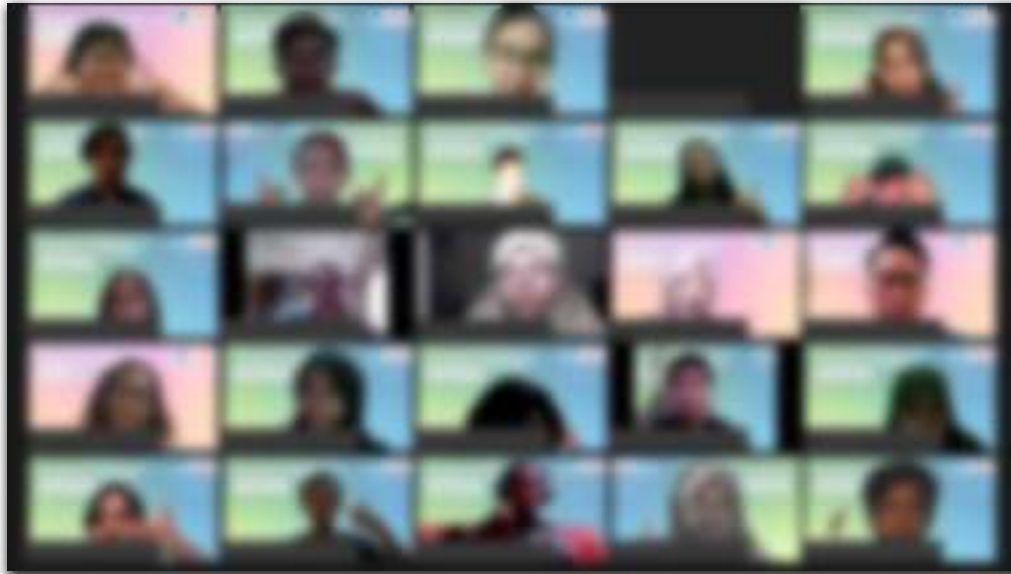
# Engineering in Action ( EiA )

Community service combined with collaborative & interdisciplinary activity among academia (ITS & NTUST Taiwan), government and community.



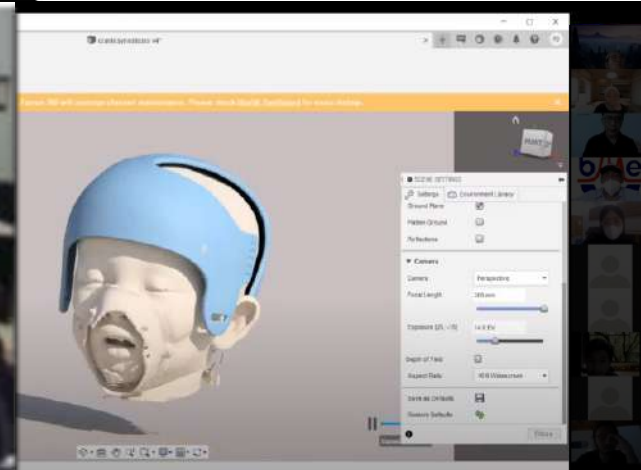


# International Competence of Healthcare Technology



Case based learning – problem solving program between academia (ITS & Vives Belgium), hospital & in Indonesia.

Eight case studies explored in 4 months program.



# The Place of Blue Energy & Blue Economy: Developing Indonesia's Blueprint



**Academic - Industry Partnership in  
Implementing Marine Renewable Energy.  
Lessons Learnt:  
THE ORKNEY EXPERIENCE**



Collaborative program between academia (ITS – Heriot Watt University, UK) and Industries (PLN & Aquateira)

**Current Condition & Challenges of Blue Energy in Indonesia from Industry's Perspective (Electricity Utility)**

Dr. Zainal Arifin  
Executive Vice President  
Engineering and Technology Development

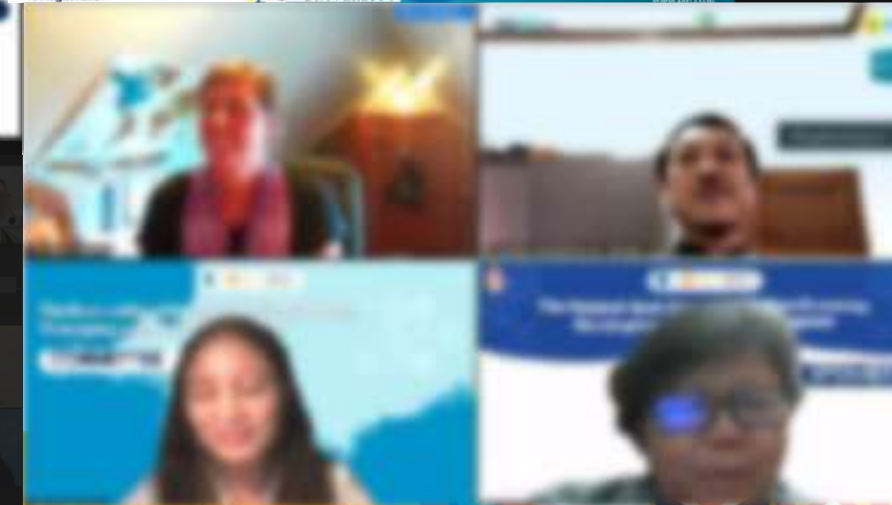


The Place of Blue Energy in the Blue Economy: Developing an Indonesian Blueprint  
13 August 2021



Understanding the impact of changes in resource usage- what does long term success look like?

**Portable Cold Storage-Fish Dryer (PORCOS-FIDA) seebeck effect and solar PV powered A Case Study in Nusa Penida for Empowering Traditional Fishermen**





# Global Project Based Learning ITS – SIT – IHI

Problem based learning combined with collaborative & interdisciplinary activity among academia (ITS – SIT Japan), Surabaya City Government & Industry (IHI)

Surabaya City Council for Public Works



Surabaya City Council for Public Works  
Dinas Pekerjaan Umum Bina Marga dan Pemertasan

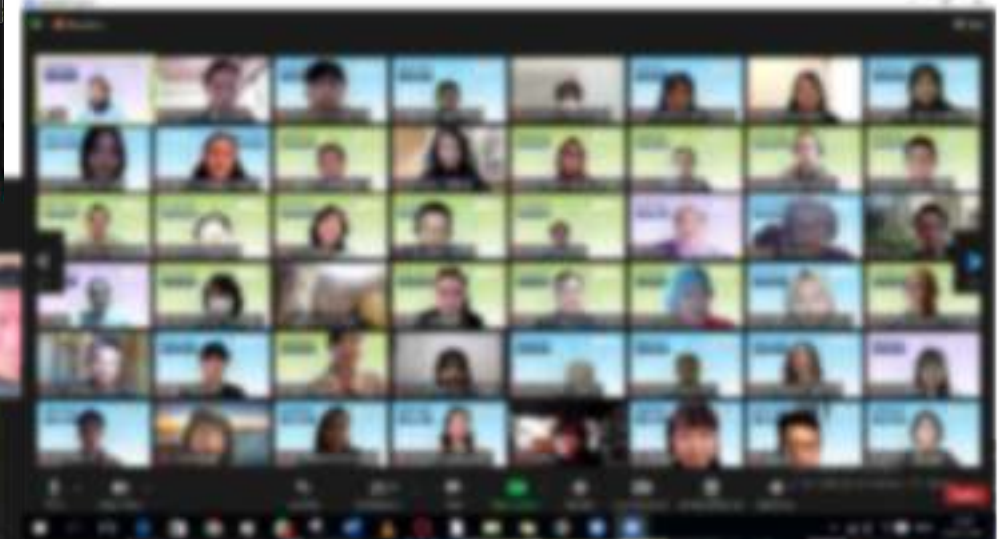
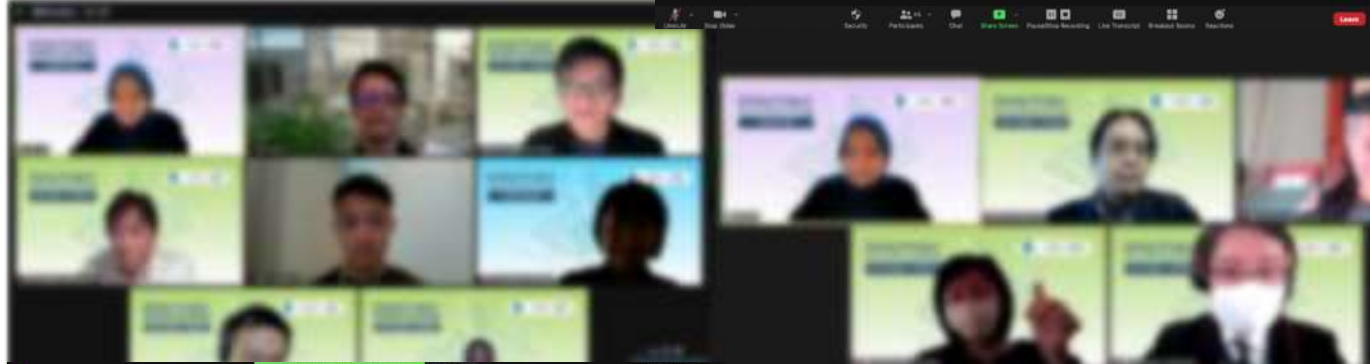
- In charge in planning, monitoring, constructing, and maintaining pavements, bridges, and drainage development
- Manage land acquisition and utilization

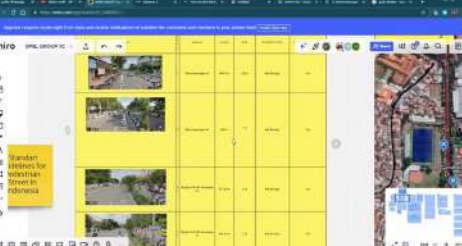
Source: The Surabaya Road Development Plan 2017-2021 on Department of Planning, Studies and Research of The Surabaya City Council for Public Works


GLOBAL PROJECT BASED LEARNING  
23 October – 9 December 2021

## WATER RESILIENCE Sustainable Water Drinking Supply

Dr. Wawan Aries Widodo, ST., MT.  
Chairman of the Supervisory Board of PDAM Surya Sembada







Quantity	Cost	Reference	WSP	WSP (MWh)
1	1000000	1000000	1000000	1000000
1	1000000	1000000	1000000	1000000
1	1000000	1000000	1000000	1000000
1	1000000	1000000	1000000	1000000



PROJECT TITLE:  
CASE STUDY:

GROUP:

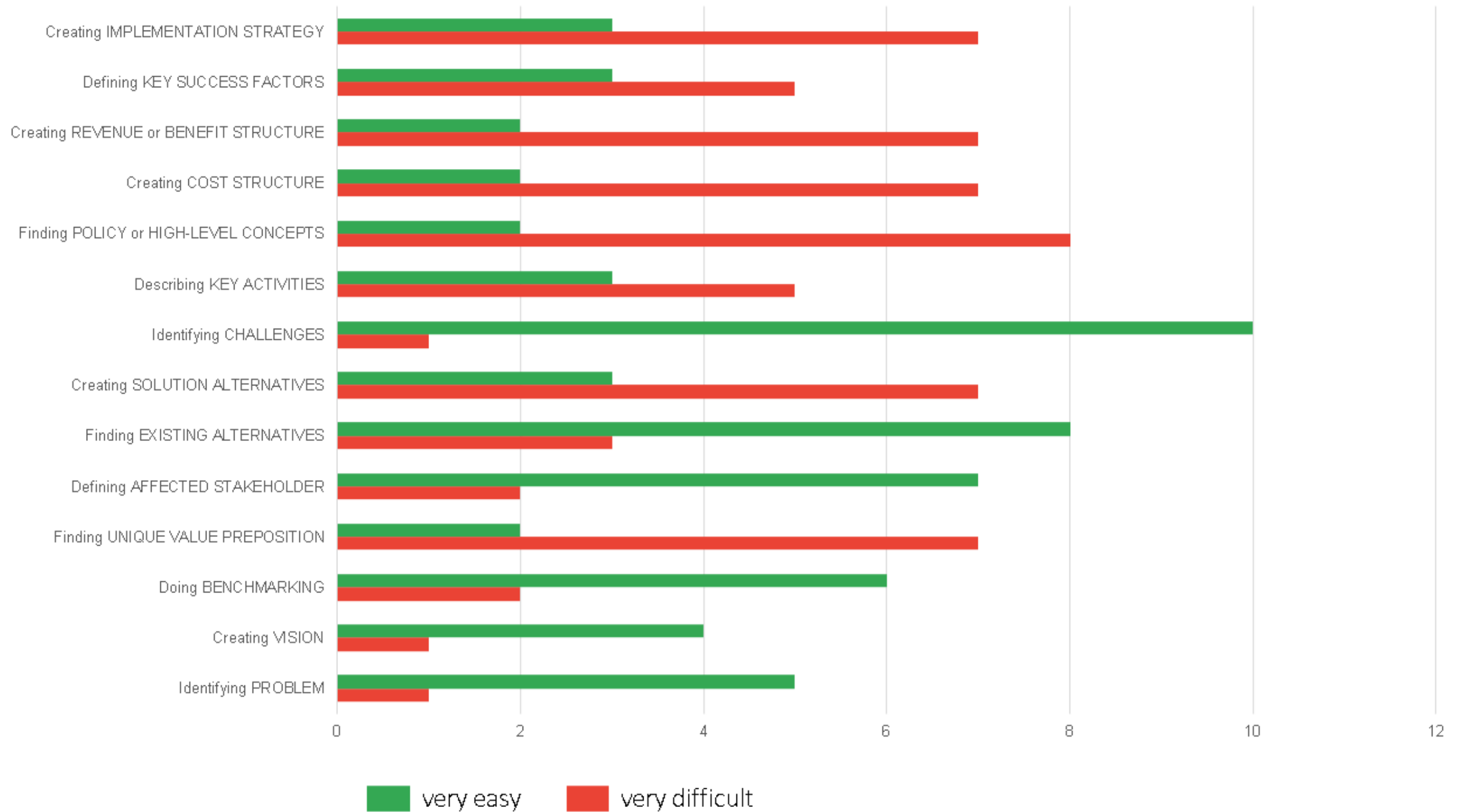


PROBLEM	VISION	BENCHMARKING	UNIQUE VALUE PROPOSITION
AFFECTED STAKEHOLDERS	EXISTING ALTERNATIVES	SOLUTION ALTERNATIVES	IDENTIFIED CHALLENGES
KEY ACTIVITIES REQUIRED	POLICY OR HIGH-LEVEL CONCEPTS REQUIRED	COST STRUCTURE	REVENUE OR BENEFIT STRUCTURE
KEY SUCCESS FACTORS		IMPLEMENTATION STRATEGY	

DESIGN SOLUTION

ADDITIONAL INFORMATION – Problem Identification/Selection Process, Connectivity between Problems (**optional**)

LESSON LEARNT FROM THIS GPbL



# Fundamental Policy Change on Tertiary Education in Indonesia

## Ambil Kendali Masa Depanmu

Kampus Merdeka adalah cara terbaik berkuliah. Dapatkan kemerdekaan untuk membentuk masa depan yang sesuai dengan aspirasi kariermu.

Daftar Program



# Kampus Merdeka, Merdeka Belajar

- Output based learning
- There are 8 flagship programs
  1. Village Development
  2. Independent Project
  3. Entrepreneurship
  4. Humanity Project
  5. Research
  6. Teaching in Remote Areas
  7. Internship
  8. Student Exchange



Source: <https://dikti.kemdikbud.go.id/wp-content/uploads/2020/05/Buku-Panduan-Merdeka-Belajar-Kampus-Merdeka-2020-1.pdf>

# Conclusions

- Penta-helix collaboration is needed more than ever to equip future engineers with skills & competencies needed.
- All GTI consortium members are invited to involve in nurturing the future generation.
- Is it a burden or a privilege?

**AWARE – BEWARE – CARE – DARE**





# Thank You

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