

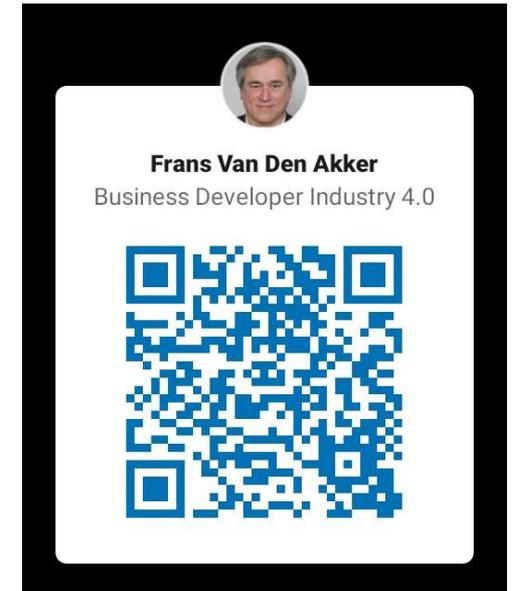


TOPSECTOR ENERGIE
Empowering the new economy

**TOWARDS FLEXIBLE, SCALABLE LEARNING
APPROACHES THAT FIT THE INDIVIDUAL NEEDS
OF PROFESSIONALS AND COMPANIES**

Identifying and Meeting Digital Skills Needs

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Life Long learning Challenge to upskill and reskill

- How to integrate the insights on digital technologies into our factories and benefit of the impact that digital technologies can have on our industry?
- How to keep up to date as an professional in the fast changing digital technology world?

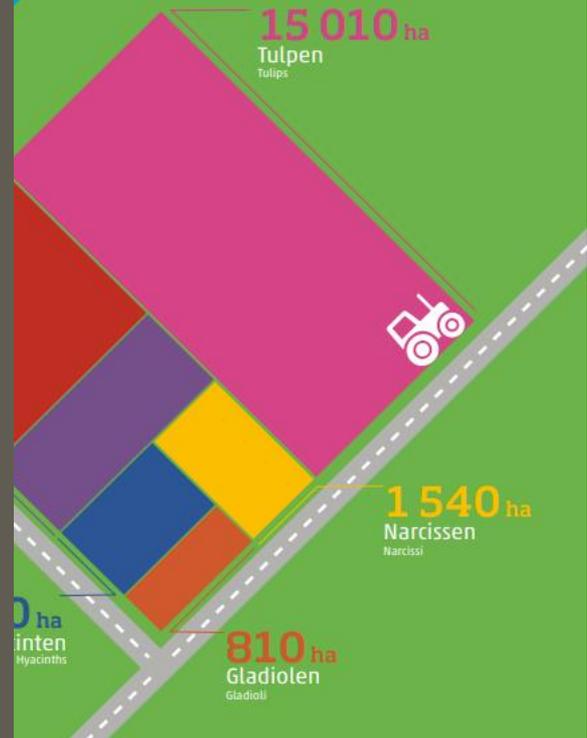


POTS NL

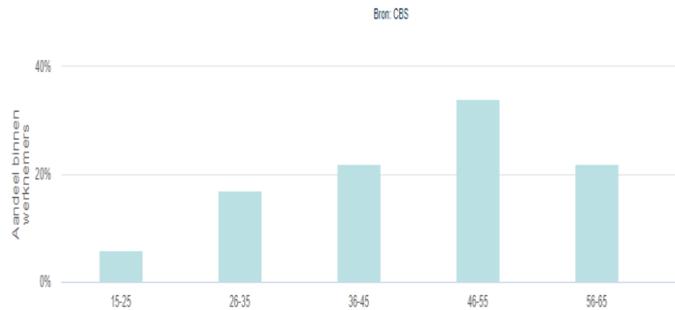
ART



telen we het meest?
ommon?

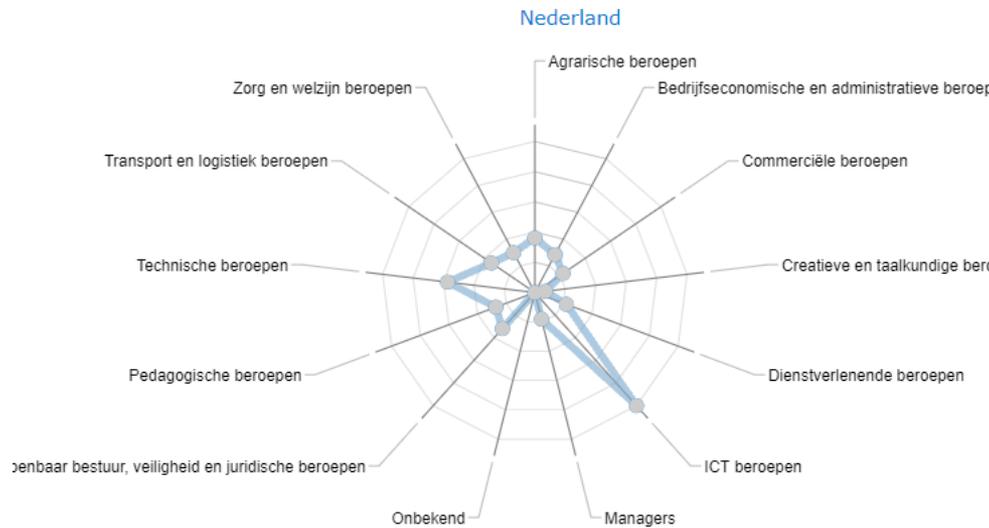


Age Distribution

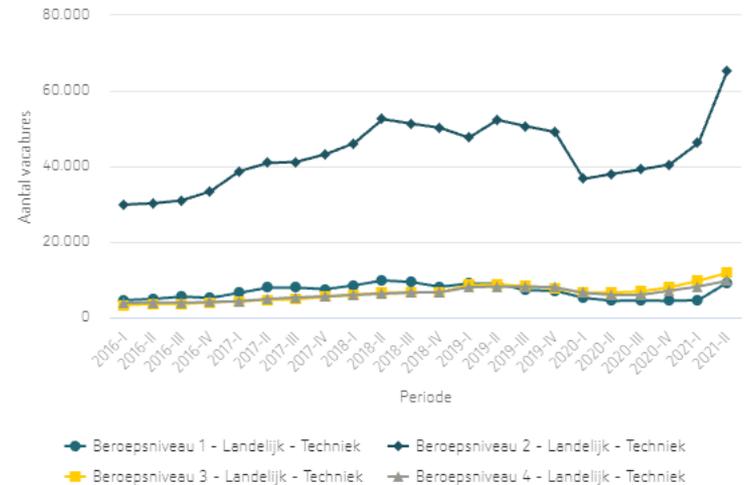


Sector	Aantal werkzame personen in 2020
19 Aardolie-industrie	6.000
20 Chemische industrie	45.000
21 Farmaceutische industrie	14.000
22 Rubber- en kunststofproductindustrie	33.000
Totaal	98.000

Labour market: vacancies



95.5K Vacancies for Technology Jobs



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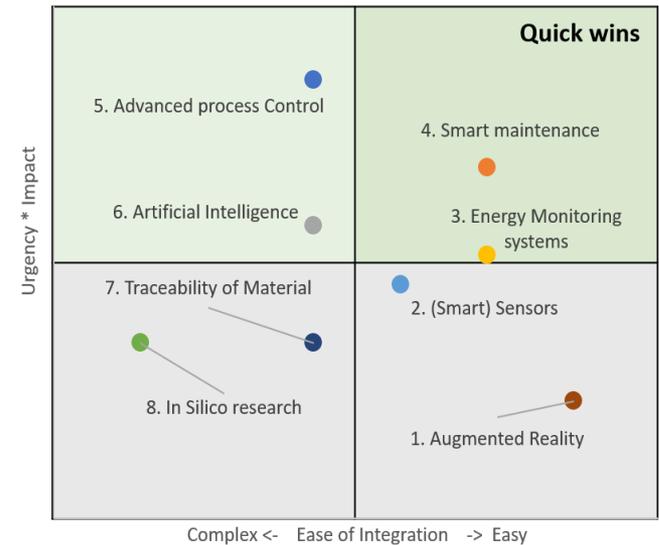


- Aging workforce.
- Declining number of people entering the labour market.
- Large competition with other sectors.
- Next to attracting youngsters to technology and retaining employees we need Reskilling and Upskilling.
- The half-life of knowledge across any profession is shortening rapidly.
- Darwin: “It is not the strongest of the species that survives, nor the most intelligent. It is the one that is the most adaptable to change.”
- Futurists and philosopher, Alvin Toffler: “The illiterate of the 21st century will not be those who cannot read and write, but those who cannot **learn, unlearn, and relearn.**”

Digital Technologies Trends

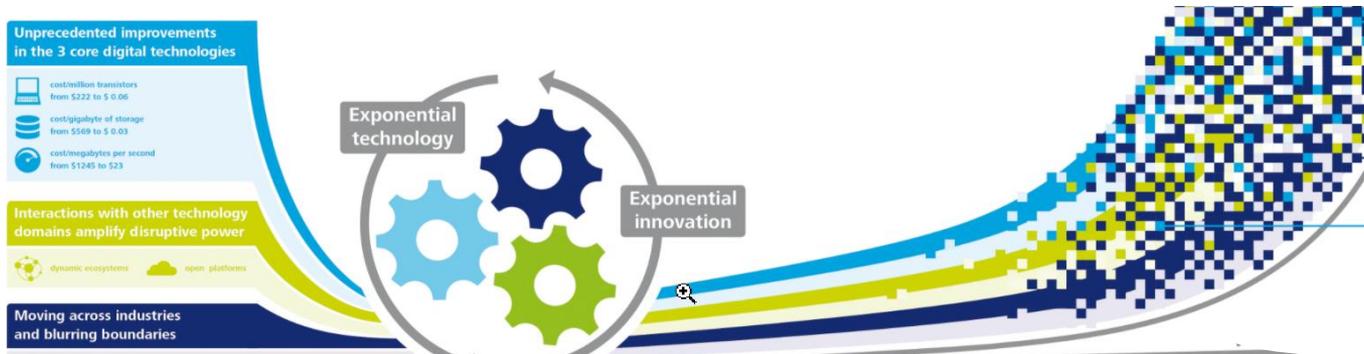
- Digitalisation is key for the **COP26 pathways**
- **Twin transition** taking place: energy transition parallel to the digital transition
- New data sources:
 - Handheld spectrometers that bring the lab to the sample.
 - Tracking movements on site,
 - Tracking customer reactions from social listening.
- **Factory of the future: Mars?**
- Obtaining **Digital maturity can be planned**, assessed and benchmarked.
- Fear for **algocracy**: algorithms take the decisions. Data is biased or incorrect, Need for responsible and explainable AI.
- **Safety**: we need to detect, withstand, adapt to and rapidly recover from incidents and attacks, while preserving the continuity of critical infrastructure operations.

Ease of Integration vs. Urgency * Impact



Oxygen on Mars generated by Perseverance Rover's MOXIE instrument (fir...





Innovation Learning Curve



The Continuous learning Challenge

The skillset we are looking for

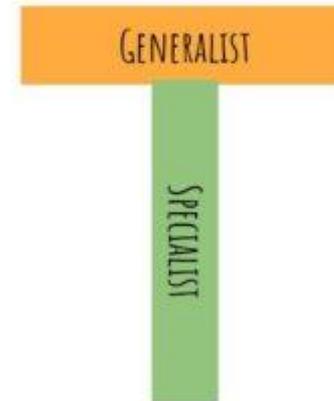


- Competence matrices
- Competence profiles for job clusters

T-SHAPED PROFESSIONAL

Digital skills:

- Data translator skills
- Communication with machines
- Data safety
- Using data to analyze problems
-



Job related and specific skills

- ### Green skills
- Energy transition,
- ### Soft skills
- Adaptivity
 - Cooperation

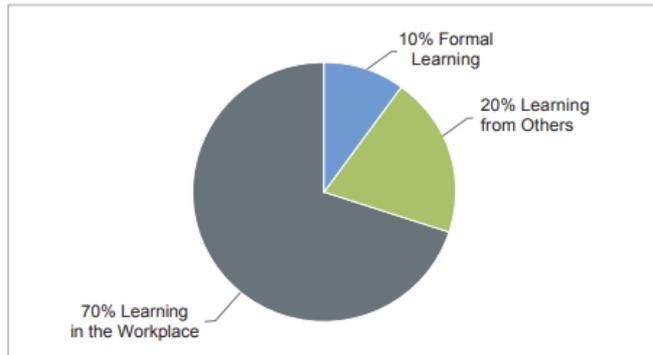


Learning approaches

Traditional

The 70-20-10 approach is a model of development in which 70 percent of learning happens in the workplace through practice and on-the-job experiences; 20 percent comes through other people via coaching, feedback, and networking; and 10 percent is delivered through formal learning interventions (see Figure 1).

Figure 1: The 70-20-10 Learning Model



Source: Bersin by Deloitte, 2014.

New

- Learning by Education: courses, schools, exams: at own time and pace
- Learning by Experience: workplace, stretch assignments, job rotations, and special projects.
- Learning by Exposure: In interaction and relationships. It helps employees develop by building connections with other professionals and thought leaders. Innovation projects & consortia: using collective intelligence, it is important to partner with a lot many companies for solutions: Establish a strong collaboration so that anybody who needs any information solve a specific problem can reach out to a at any time to a broader group....

(source: people matters 2016)

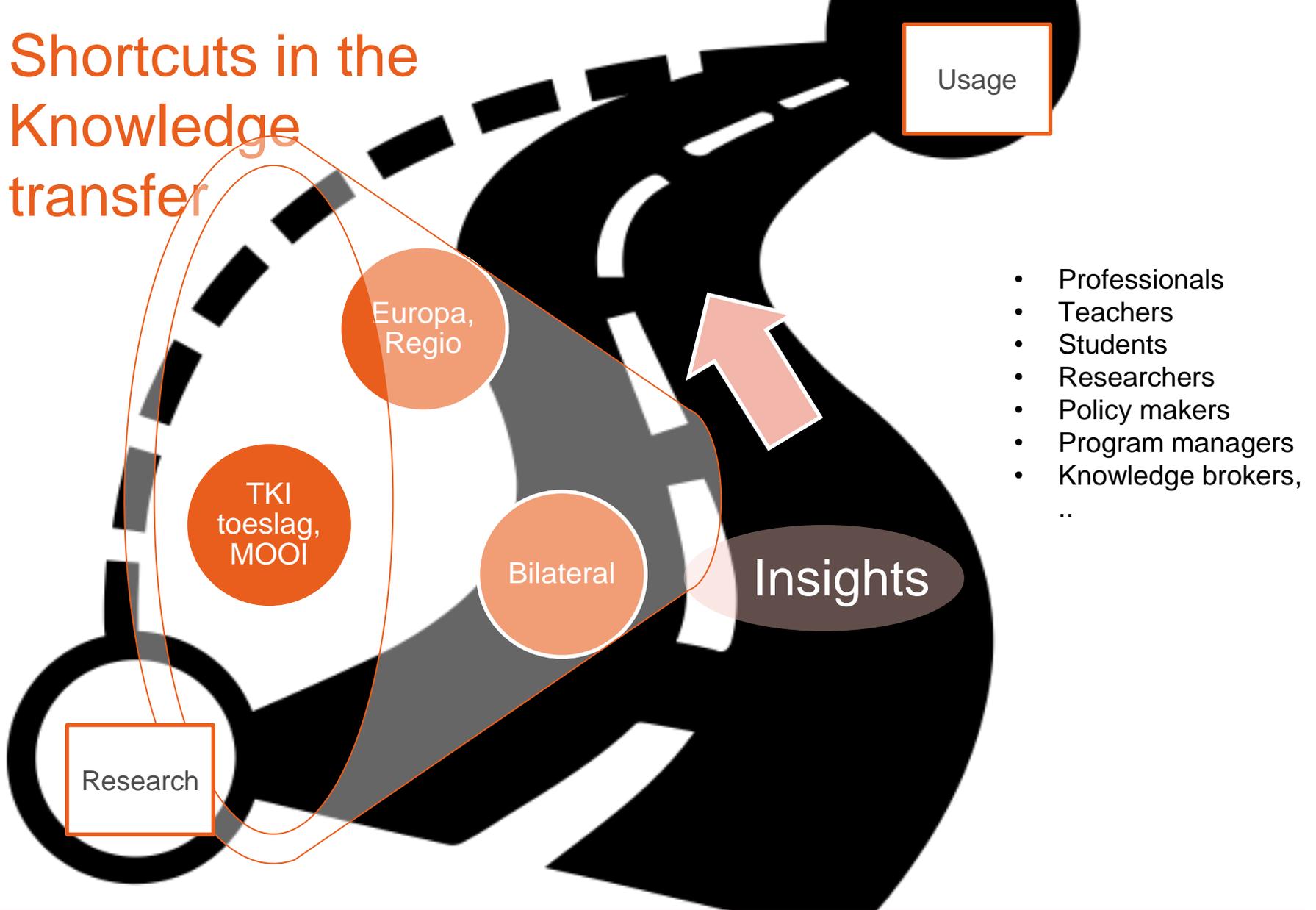


Comparison of approaches

Learning approach	Strong Points	Attention needed
Incompany training activities	Building one culture, one language and translate concepts to the needs of the company Can be used to inspire and connect	Development costs and time effort of participants
Online courses	Gives general introduction, scalable, low cost Can provide official certificate , so suited for personal development	Not specific and must be in line with individual needs
Webinars, congresses	Provides external network and information on trends	Followup is diificult
Community sessions	Enables learning from peers: a preferred way of learning for professionals	Asks for moderation and mutual topics
Open innovation	Strengthens strategic partnerhips and may bring innovation ideas	Innovation goals to be selected in line with strategy of the organisation



Shortcuts in the Knowledge transfer



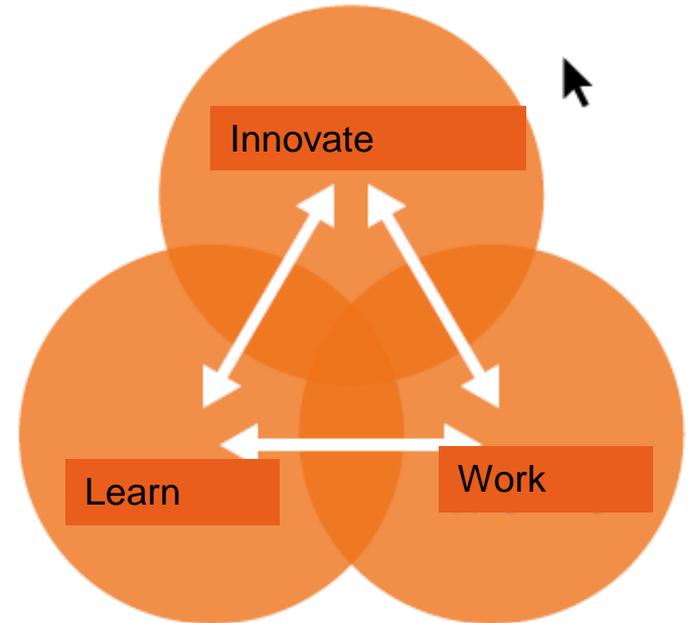
Exposure to new knowledge using Learning Communities

Learning Community approach

We want innovations to pay off quickly in practice, that companies and organizations can apply them quickly and that people are adequately trained and equipped to do so.

We want users to be involved in this process at an early stage and for young people to be trained through education with the right competences and skills.

We want parts of the infrastructure not to work alongside but with each other. That is a matter of smart organizing: innovating, working and learning to organize close to each other. We call this concept the learning community.



Dutch approach to create knowledge eco systems

- Continuous Learning activities are criteria element in innovation project that apply for grants.
- National programs developed & provide tools to start and execute learning communities.
- We use fieldlabs and available facilities as seeds to start the learning communities



Een luchtfoto van de Chemelot campus in Limburg. Beeld: NED2011 via Wikimedia Commons.



An important transfer mechanism in the knowledge eco system

The idea of a **knowledge ecosystem** is an approach to **knowledge** management which claims to foster the dynamic evolution of **knowledge** interactions between entities to improve decision-making and innovation through improved evolutionary networks of collaboration.

For innovation ecosystems and knowledge ecosystems alike, the key challenge is how such loose collectives can be organized to achieve uncertain, complex, and often highly ambitious goals (Järvi 2018)

In general, any multi-partner collaboration for knowledge creation requires some level of joint goal setting and collective action toward that goal



Multiple actors work together

- Private education
- Knowledge institutes
- Innovation consortia
- PPS: field labs, skill labs
- Graduate schools
- Learning Communities
- Technology promotion organisations (governmental and sector)



Example: Learning Community Smart maintenance @Gilze Rijen – Noord Brabant:



An Actionscan to support the start of a Learning Community

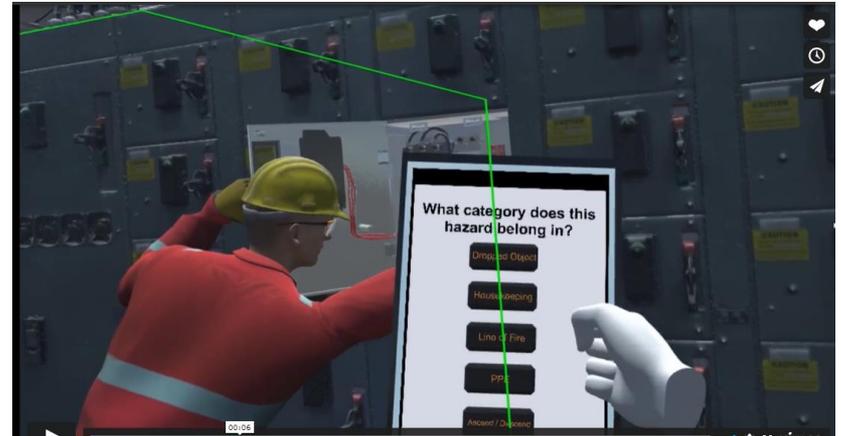
The Action Scan consists of three parts:

- * Introduction about why Learning Communities are important, what kind of function (activities) they have and what their predominant characteristics are;
- * The scan (the step-by-step plan) itself, which enables partners with the ambition to develop further into a Learning Community, to gain insight into where they approximately stand in this process (positioning) and what the points for attention are in the further development.
- * A series of inspiring examples that make more concrete what the variety of organization and content can be.



Learning about digital & learning with digital

- Personalized training
- Scalable
- Asynchronous learning
- Collaborative
- Reduces the needs for expensive labs/facilities
- Special suited for Safety training



VR Kinemagic EIS_short clip



AI approach

- National level: AI Coalition with working group HCA
- Regional innovation hubs
- National AI course
- Certificate for professionals to strengthen data translator skills
- 7 regional Learning Communities centered around universities

- Queen Maxima started the education campaign



Reskilling

- Labour transition pathways
- Program *House of skills*: working on
 - Attractiveness of the profession
 - Onboarding process in companies
 - Image of potential employee
- Online modular approach
- Usage of Hybrid teacher: that work in industry and at a knowledge institute

Upskilling

- Data translator
- Data stewardship
- Special focus on cyber security and cyber resilience: a topic for everyone...!
- Part of staff development policy



Upscaling approaches

- Train the trainer
- E-learning
- Certificate separated from training (driver license concept)



A multilayer approach



- Context: subsidies, Certification framework, legal framework
- Reaching out to external sources and collective intelligence
- Digital transformation, competence frameworks
- Individual learning objectives

