

# Spreading digital transformation culture in the industry: HRD, skill formation and policy response

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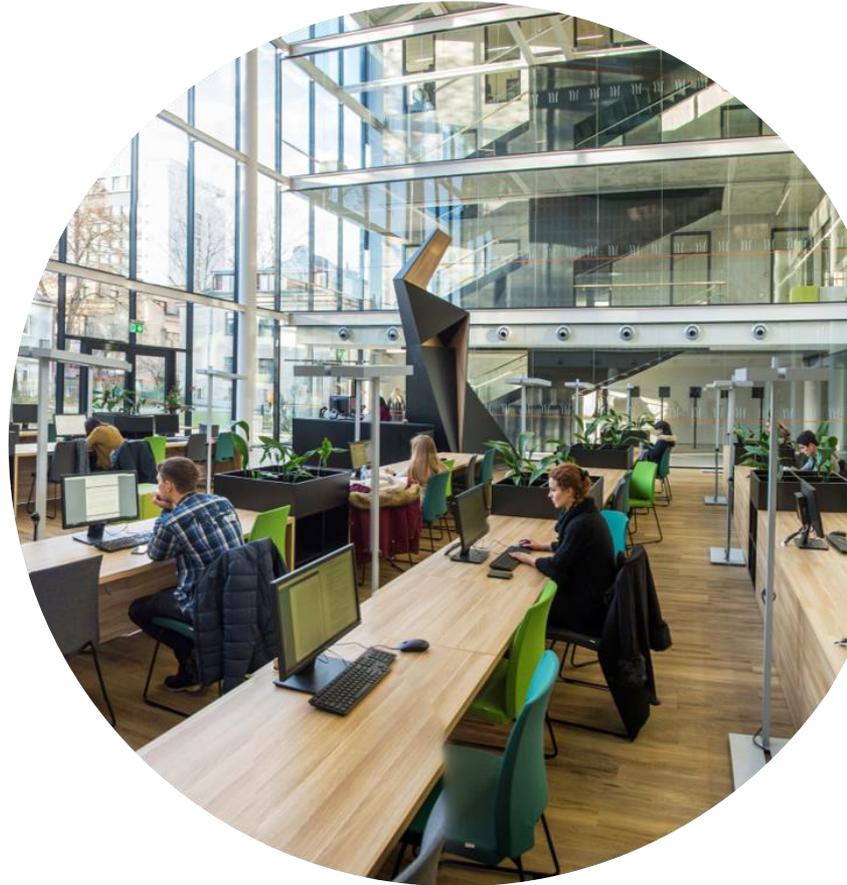


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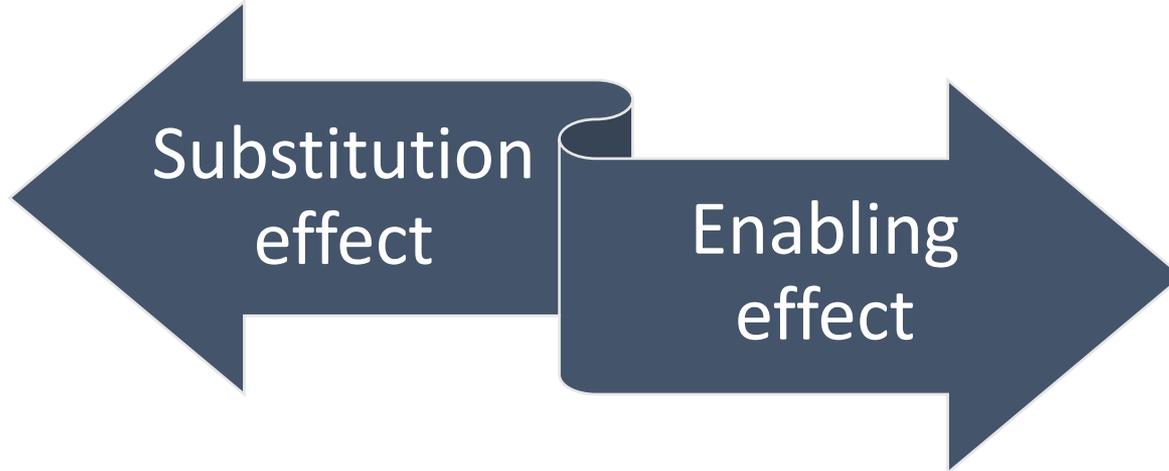
# Content

- Digital transformation of work and its implications to employment and HRD.
- Skills needs and responses to these needs: implications of digitalization to skill formation and its attractiveness to youth.
- Implications of digitalization to policy in the field of employment and skill formation.
- Examples from the projects.



# Digital transformation cultures in enterprises: main orientations

- Economic optimization of production processes by using the power of digitalization and automation to displace the human work. **Substitution effect.**
- Enabling of employees in dealing with increasing complexity of work and socio-economic challenges. **Enabling effect.**



# Digital transformation of work: aspects important for skills and attractiveness of jobs – substitution effect

- Substitution effect of digitalization: smart machines and technologies (AI, CPS, IoT) outperform human beings and replace them in all work processes, including high-skilled and emotional work.
- *“Increasingly capable machines (whether using AI, Big Data techniques or techniques not yet invented) will arrive at conclusions and offer guidance that in human beings we would regard as creative or innovative.” (Susskind and Susskind, 2015).*
- AI fallacy (Susskind and Susskind, 2015; Susskind, 2020).
- Digital Taylorism and automation of non-routine work.
- Economic reasons for replacement humans with machines: the target of automation - middle and high-skilled work.

# Substitution: implications for skills and attractiveness of work

- Contribution to the “death of human capital” (Lauder, Brown).
- Hollowing-out effect, increasing skill polarization and over-qualification, ‘sharing the scrap’ economy and labour market (Reich).
- Danger of secular long-term economic stagnation due to the lack of demand caused by the replacement of humans with robots and AI in the workplaces, as well as risks of lowering of wages and deterioration of employment quality (Stiglitz, 2019).
- Re-discovering of the meaningful work, which has a low esteem in the traditional industrial and post-industrial economy (Susskind, 2020).
- Universal Basic Income and Conditional Basic Income (Susskind, 2020).

# Enabling effect of digital transformation in work (1)

- **Mastering of networked systems with decentralized intelligence, handling data and analysis** as well as the **ability to safeguard flawless operation of plants** are among the most important requirements for work on production sites (baymee, 2016).
- Workflow design will have to be adapted to the **more close work of humans with machines by creating a safe and productive environment**, what would also make the work more **collaborative**, increase **agility of companies** and **nonhierarchical management structures**.
- Increasing complexity of work tends to **increase the significance of non-routine activities in the highly automated production processes** and requires to understand the work actions by **holistic perception**, to apply explorative and dialogical approaches, intuition, empathetic bearing (Pfeiffer 2017; 2018).

# Enabling effect of digital transformation in work (2)

- In highly automated plants all tasks, especially service, maintenance and repair, have been structured around software tasks.
- Highly qualified technicians are necessary to safeguard this software technological access to plants, while programming is left to the engineers (baymee, 2016).
- **“Liberating effect” of the AI in the different work processes:** the AI driven educational solutions help teachers to focus on the teaching and mentoring that cannot be automated through AI and liberate them from many auxiliary administrative tasks.

## **Technological determinism in discussing scenarios of work digitalization (Lee and Pfeiffer, 2019)**

- 1) the structural changes of work process and employment cannot be linearly derived only from the change of technologies;
- 2) ignoring of the social context of the Industry 4.0 change and innovations, where the VET and qualifications can play a significant role.

# Change of skills needs - challenging traditional boundaries (1)

- Erosion of the disciplinary and occupational boundaries of competencies enhanced by:
  - increasing virtuality of production processes,
  - individualization and high flexibility of production processes,
  - integration of digital, virtual and real dimensions of production process,
  - increasing transparency of the executed production processes (Gorltd, 2019).

## Change of skills needs - challenging traditional boundaries (2)

- Maintenance still requires traditional manual skills as well as the mastering of CPS, robotics, pneumatics, hydraulics, drive technology (baymee, 2016).
- Self-management of production and decentralized control of the autonomous objects reduce the importance and demand of skills and competencies in the work organization (Gorltdt, 2019).
- Increasing demand of systemic understanding and cognition of the work processes and technologies, what enables their planning and design (baymee, 2016).

# Implications for skill formation policies

- Moving the structure of vocational and professional qualifications upwards through introduction of new additional qualifications (*Zusätsqualifikationen* in Germany).
- Academization of vocational qualifications.
- Dual training or modularization?
- Combination of work-based learning and academic studying.
- Investment in the upgraded vocational training and learning environments (*Überbetriebliche Berufsbildungsstätten* in Germany, sectoral practical training centres in Lithuania).

# Varieties of digital transformation cultures – evidence from the projects

Erasmus+ strategic partnership projects dedicated to digitalization of work processes, 4IR and VET:

- VET 4.0 <http://vet-4-0.eu/>
- Change 4 Industry <http://change4industry.eu/>
- AI in VET
- STEP-UP

## VET 4.0

- Digital transformation culture as a factor of the change in the work processes of mechatronics and electronics.
- Perspective of VET stakeholders: students, teachers, trainers.
- Competence needs of (future) workers.
- Competence needs and VET teachers and trainers.
- Competence matrix.
- Modules and learning materials developed and designed by/for students and teachers.

## Change 4 Industry

- Digital transformation culture in the context of work processes of CNC machining in the Baltic countries and Germany.
- Perspective of enterprises and business stakeholders.
- Bringing the digital transformation related skills in the qualification, initial VET curricula and CVT.
- Development of the online platform and learning materials.

## AI in VET

- Digital transformation culture in the development of AI solutions in the world of work and VET processes.
- Perspective of VET teachers: target is further training of the teachers and trainers necessary in order to be able to initiate new teaching / learning arrangements in different concepts related to AI application.
- Transformation of the VET processes in order to provide teachers the competencies needed for implementation and usage of the AI solutions in the work processes.
- Enabling usage of the AI solutions for the training practices, organisation of training and didactic processes, assessment of competencies.

# STEP-UP

- Digital transformation culture for coping with skill polarization and social exclusion.
- To develop new successful pedagogical models to prepare, train and support various in-company tutors/tutor/mentors involved in WBL settings with respect to “digitalization I 4.0” working places and considering different types of learners, including socially disadvantaged.
- To develop new approaches to training aimed to help and accompany all the companies involved in a WBL path, so that it can acquire more training capacities and consequently a greater responsibility for training.
- Work-based learning, digitalization of the VET processes, development of didactic approaches for teaching and learning ‘digital’ skills.

Thank you very  
much.

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