Versatile Skills Development Methods for the Needs of Digitized Manufacturing Industry

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High cost country – High Value Products – Highly Skilled People

Examples of Finnish global market leaders

4th Industrial Revolution for Finnish Companies:
“Making Lot-size-1 economically feasible”

Ref: Prof. Tuokko, 2016
Current Status

Children born between 1970-2018

* 2018: 47577

2019: Number of open study positions for universities: **48,000**

2019: Estimation for children born: **45,000**
Extending the educational system

Ref: http://www.eun.org/c/document_library/get_file?groupId=43887&uuid=d5f47be2-6d3b-4d8a-82d1-5f37ed9c7366
New ways to approach education

**Problem Solving**
- introducing non-routine and practical problems
- challenging to solve problems collaboratively
- encouraging learners to acknowledge and solve professional identity issues

**Reflection**
- stimulating critical reflection on learning and experiences
- encouraging reconstruction of the meaning of experiences
- promoting responsive guidance through mentoring

**Learning from Errors**
- helping learners to resolve tensions and develop flexible imaging
- prompting epistemic process help to identify flaws in mental models
- developing learners’ time and resource management
- promoting critical dialogue through collaboration and mentoring

**Boundary Crossing**
- developing learner identity and adaptation
- creating multiple opportunities for participation and learning
- rationing university and workplace perspectives
- explicating cyclical expertise development process between work and academy

Ref. Lanz et al, 2018
Educational environment
FMS Training Center & Virtual FMS

Non-existing system can be replaced with a simulator

Cloud

MMS controller

Virtual system

Status requests

Machine status, pallet location, other dynamic information

Control commands

Feedback from the system

System configuration (static information)

Location independent visualization

Physical system

Simulator

https://research.tuni.fi/virtualfms/
FabLab for robotics: RoboLab Tampere

https://research.tuni.fi/robolabtampere/
Thank You!

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