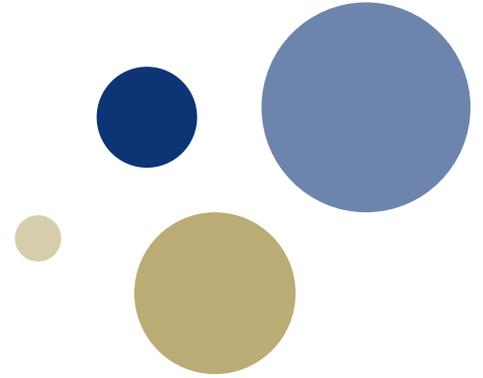




**NTNU – Trondheim**  
Norwegian University of  
Science and Technology



# **CPEA-LT-2017/10047**

**NTNU-KPI Collaboration within Industry 4.0 education**

N. Peter Østbø, Project coordinator, NTNU Gjøvik

# Welcome!

## Online Summer School Course in "Sustainable manufacturing in Industry 4.0: technologies and solutions"

co-organized by the Norwegian University of Science and Technology (NTNU) and  
National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" (KPI)

### SCHEDULE OVERVIEW:

Monday Sept 14th		Tuesday Sept 15th		Wednesday Sept 16 <sup>th</sup>		Thursday Sept 17th	
Time	Module	Time	Module	Time	Module	Time	Module
14:15-18:00	Introduction to Industry 4.0 and Sustainable Manufacturing	14:15-18:00	Industry 4 and Manufacturing Management	14:15-18:00	Product Development	14:15-18:00	Additive Manufacturing Technologies

*All times are shown in **Kyiv local time** (GMT+03:00)*

*Lecture materials will be made available online after the conclusion of the course at [ipd.kpi.ua](http://ipd.kpi.ua)*

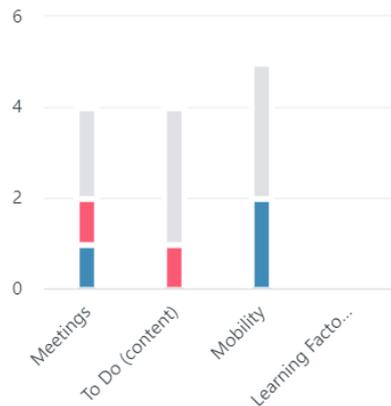
# Project Management

- New project coordinators (ok)
  - Tragic loss of our planned coordinator at KPI
- Efficient use of Microsoft Teams
  - Collaboration tool for meetings, shared content and planning
- Industry 4.0 definition and tools (Festo Didactic)
  - Industry 4.0 Strategy and implementation (Acatech-2016)





● Ikke startet	8
● Pågårr	3
● Forsinket	2
● Fullført	6



## Medlemmer

## Oppgaver



## Meetings



2019-05-14 Skype-meeting



2019-04-09 Skype meeting



2019-03-19 Skype-meeting



Physical meeting at KPI, spring 2019



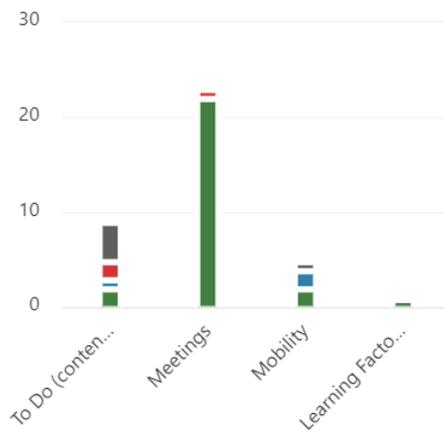
Tavle Diagrammer Tidsplan

## Status



● Ikke startet	5
● Pågår	3
● Forsinket	3
● Fullført	27

## Samling



Filter (0) ▾ Gruppert etter Samling ▾

## Oppgaver

+ Legg til oppgave

## To Do (content) ▾

## Meetings ▾

2020-09-11 at 15:00 (tentative, NTNU-time) Last things before Summer School...

📅 09.09. ⌚ 0/2

AN

SS



## Mobility ▾

 Student exchange- plan Summer-school 2020 @ KPI

25

Brukere

7

Apper

0

Møter

652.87

MB

SharePoint-filer

11

Innlegg

18

Svar

29

Omtaler

15

Reaksjoner

## Aktive brukere



16

Aktive brukere

9

Inaktive brukere

## Rolle



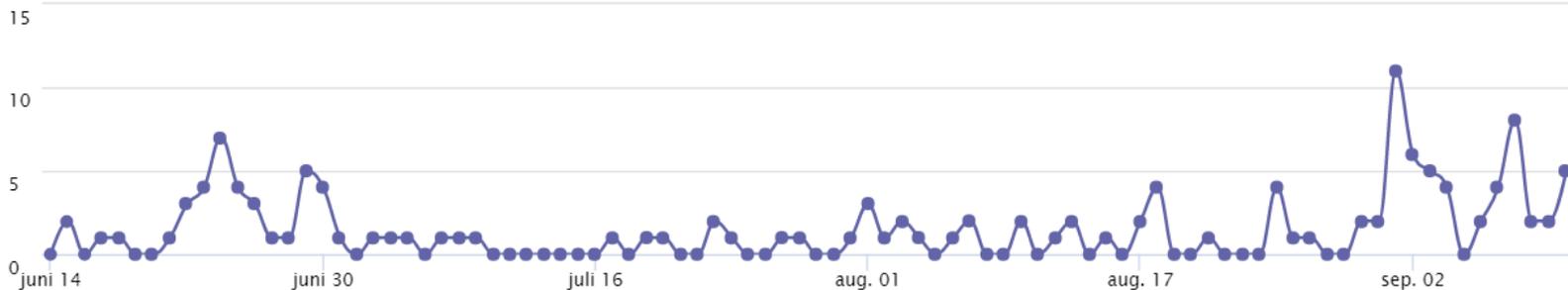
10

Eiere og medlemmer

15

Gjester

## Aktive brukere





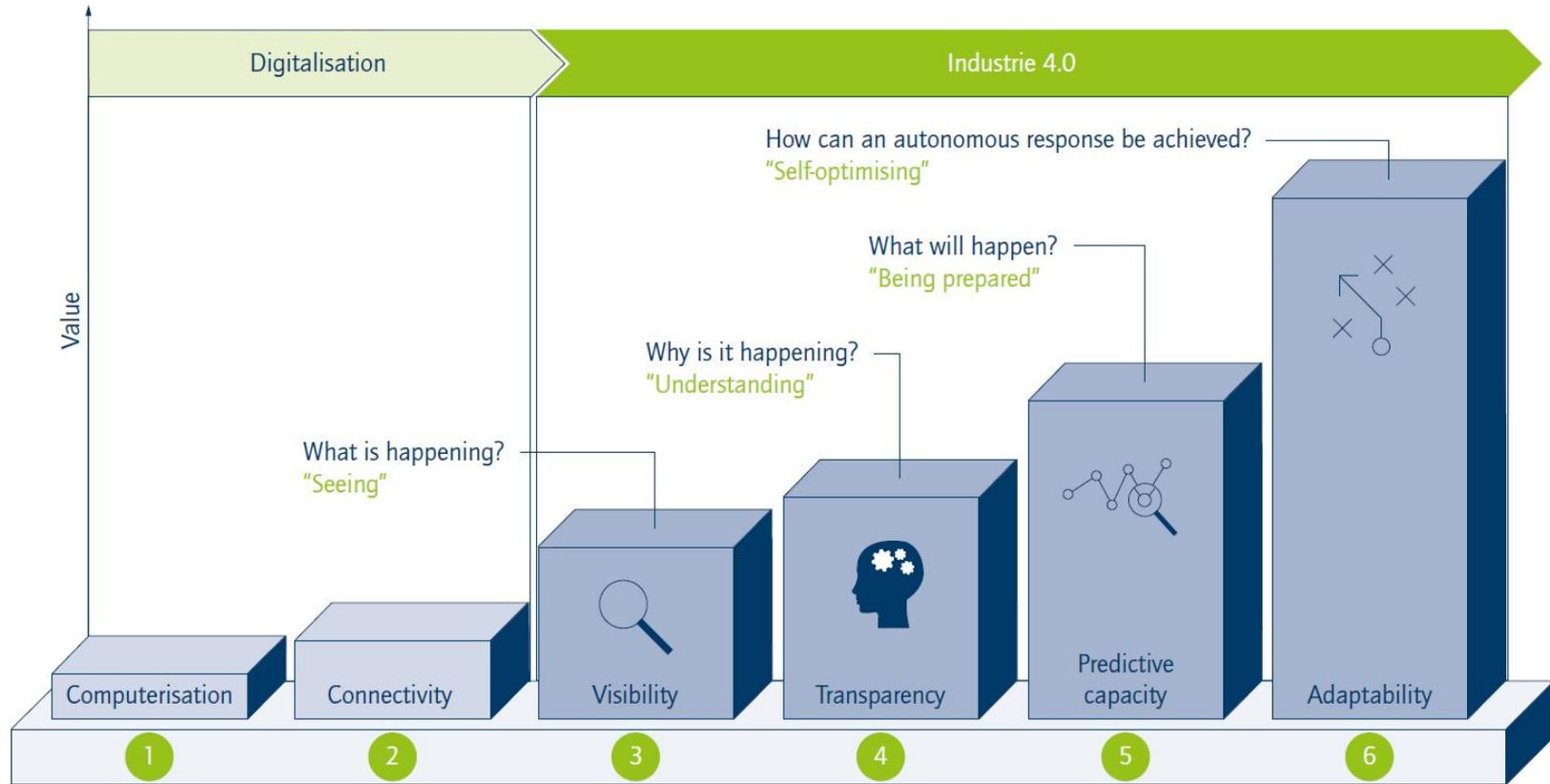
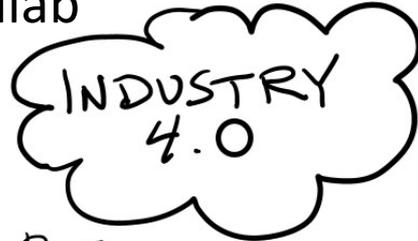


Figure 5: Stages in the Industrie 4.0 development path (source: FIR e. V. at RWTH Aachen University)

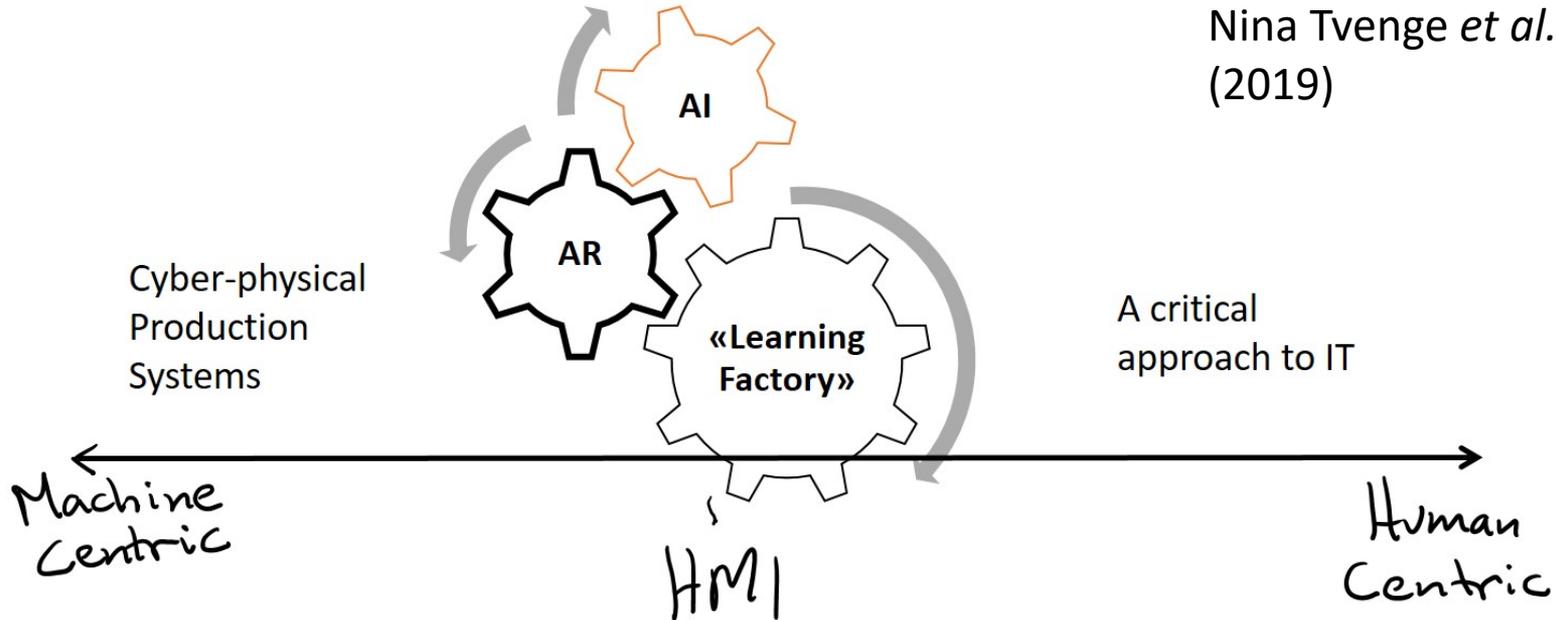
Vision/Sustainable Future

Learning Factory: Manulab



Reference  
Architecture

Nina Tvenge *et al.*  
(2019)



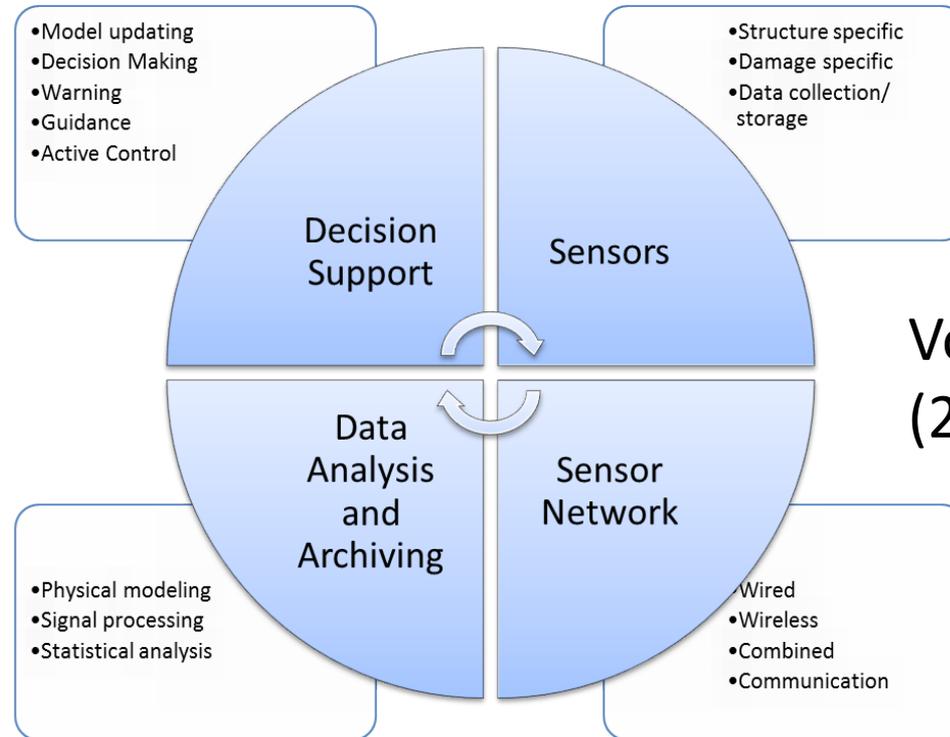
# Bloom's taxonomy of learning



“Flipping the classroom” has become something of a buzzword in the last several years, driven in part by high profile publications in The New York Times (Fitzpatrick, 2012); The Chronicle of Higher Education (Berrett, 2012); and Science (Mazur, 2009); In essence, “flipping the classroom” means that students gain first exposure to new material outside of class, usually via reading or lecture videos, and then use class time to do the harder work of assimilating that knowledge, perhaps through problem-solving, discussion, or debates.

Brame, C., (2013)

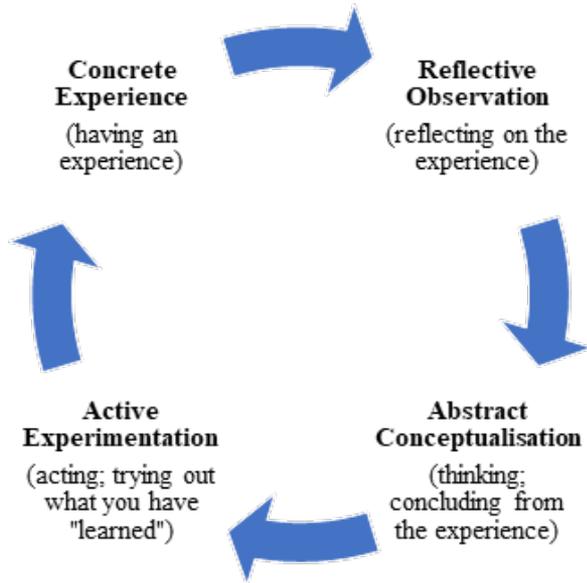
# Architecture Development- Decision Support System Structural Health Monitoring System (NOWITECH report 2012)



Vogl *et al.*  
(2012)

**Kolb & Kolb (2012)**

## **6 points on experience based learning**



- Learning is best conceived as a process, rather than in terms of outcomes.
- All learning is re-learning; re-learning is needed to examine, test and evolve the learner's ideas.
- Learning needs to include conflict and disagreements as they drive the learning process.
- Learning is a holistic process of adaptation, including thinking, feeling, perceiving and behaving.
- Learning results from synergetic transactions between the learner and his/her environment.
- Learning is the process of knowledge creation.

## A few references

- Tvenge et al. (2019) «to be published»
- Brame, C., (2013). Flipping the classroom. Vanderbilt University Center for Teaching. Retrieved [2020-08-26] from <http://cft.vanderbilt.edu/guides-sub-pages/flipping-the-classroom/>
- Vogl, A.; Østbø, N. P.; Bjerkan, L.; Jørgensen, J. K. (2012) [D2.3.01/02/04 Sensors for condition monitoring of different components of \(offshore-\)wind power plants.](#) 2012. ISBN 9788214052961. SINTEF Rapport (A23262).
- Kolb, A. Y. and Kolb, D. A. (2012) Experiential learning theory, in Seel, N. M. (ed.) *Encyclopedia of the Sciences of Learning*. Boston: Springer, pp. 1215–1219.