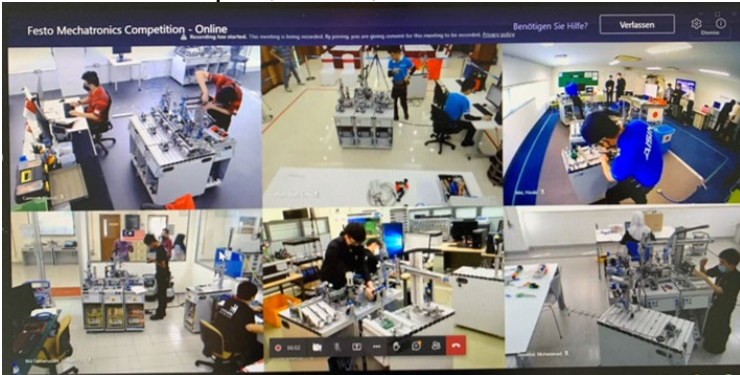


Online / Hybrid events are driven in all WS corners of the World – some examples

“Festo: We support and encourage TVET, using advanced TechEd’s and EdTtech’s, offering innovation at WorldSkills Global level, during the YOI → to set new boundary conditions.

Example Online 1: Competition in **Asia** hold beginning April 2021 Vietnam (Gold), Singapore (Silver), Malaysia Bonze Excellence Japan, Korea, Indonesia - **Mechatronics**



Example Online 2: Successful implementation of 2021 is planning in process now in 2022

South America (Peru, Chile, Argentina, Columbia)



Example Online 3: Competition Russia / Germany planned for end of May 21 – **Water Technology**



Example Online 4: Preparation Process April / May - WorldSkills America – SENAI Lead Seminar for 250 WorldSkills in South America „Job and Labor Market Transformation with Festo“ (Focus Ind evaluate online hybrid / TVET skills competitions, e.g. Industry 4.0)



Skill Challenges proposed by Festo and supported by WorldSkills (May 2021)

Rational / Value / Goal / Impact

Mechatronics Skill #04 (Team Challenge)

Industry 4.0 Skill #48 (Webinar+)

Water Technology Skill #55 (Single Challenge)

- ➔ Reach out larger WorldSkills audience / **spread the Mov.**
- ➔ Improve knowledge in **EdTech Expertise**
- ➔ Worldwide offering of WorldSkills through **digitalization**
- ➔ Getting **experience in digital/hybrid** challenges and assessment
- ➔ Supporting a **template as NOVUM** for WorldSkills members in implementation and delivery
- ➔ **SDG#4**



Mechatronics Skill Challenge 2021 supported by WorldSkills and FESTO!

| Level | 1 | 2 |
|----------------------|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| For whom? | Team | Team |
| Task No. | A | B |
| Topic | FluidSIM, CRDS | FluidSim, CRDS+ |
| Duration of the Task | 1h each | 1,5h - 2h each |
| Main based on | SW | SW-Control technology |
| Supported by | Festo Didactic (FD) SW | SW Site in Auli-RO, Web-School, Company, Performance center |
| Tasks | PC with FluidSIM, Festo LX PC with CRDS, Festo LX | PC with FluidSIM, PLC, EasyPort, Ispit, Ispit, Festo LX, Programming Laptop Circuit Diagrams, Simulation |
| Context | Circuit Diagrams, Simulation "Digital Twin", Simulation | "Digital Twin", Simulation Programming, PLC, I/O, Network, Troubleshooting |

Mechatronics Skill Challenge 2021 supported by WorldSkills and FESTO!

- 1. Skill Challenge:**
 - Different levels of difficulty and complexity
 - Task modules

- 2. Timeline:**
Event / Challenge: Autumn 2021

Skill Challenge supported by **NationalSkills, schools, organizations & FESTO**



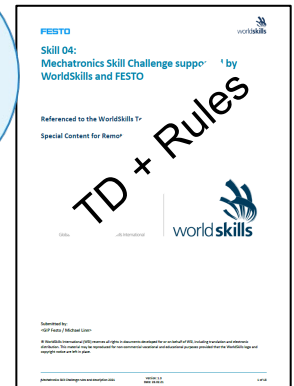
Skill #04 – Mechatronics **Reg. 26 Teams**

WSOS / Job Competencies and topics for the Skill Challenge

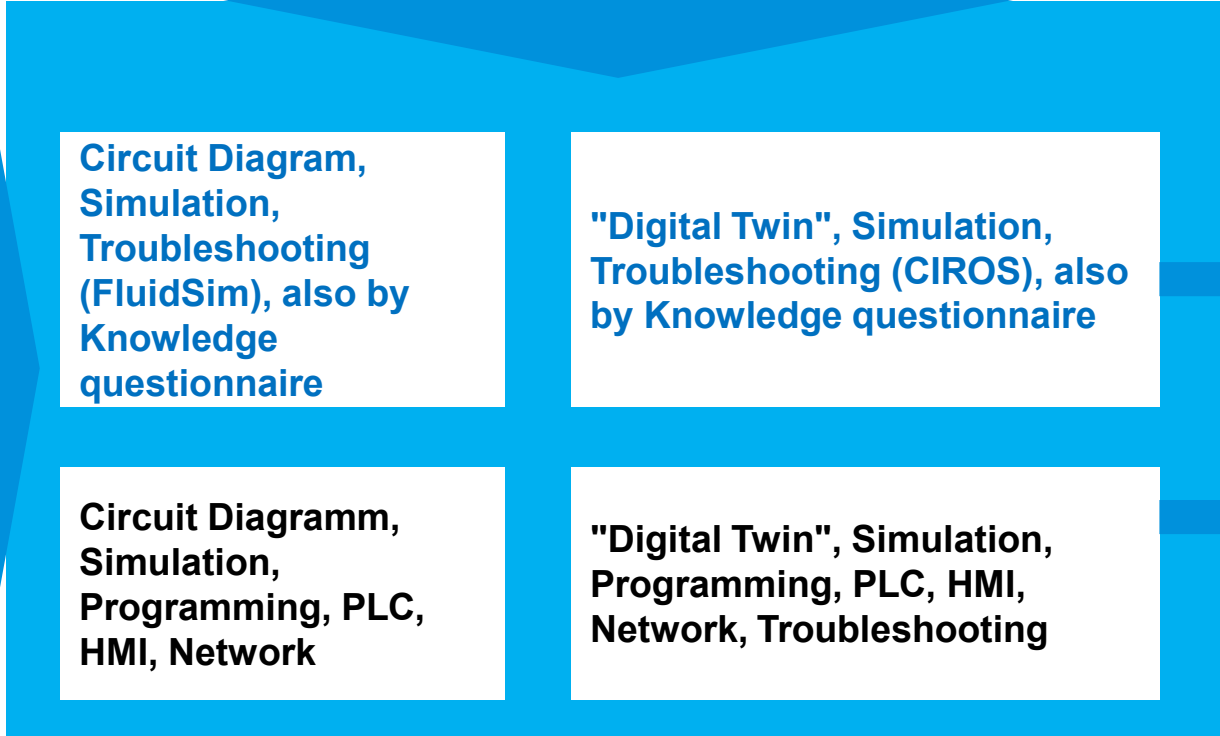


Selected Competencies to evaluate during the Skill Challenge

Mechatronics Skill Challenge 2021 supported by WorldSkills and FESTO



- Best practice (WSOS):**
- Work organization and management
 - **Work Preparation** (L1,L2)
 - Communication and interpersonal skills
 - **Teamwork** (L1,L2)
 - Developing mechatronics systems
 - Assembling, Wiring, Tubing
 - Modul and System integration
 - Assembling and commissioning with PLC
 - IO Link, Analogue value processing
 - Using industrial controllers
 - **Commissioning with PLC and using HMI** (L2)
 - Software programming
 - **Network communication (PLC/HMI based)** (L2)
 - **Working with Simulation Software** (L1,L2)
 - Circuit schematics
 - **Design and reading Circuit Diagrams** (L1)
 - Analysis, commissioning, and maintenance
 - Maintenance, Optimization
 - **Troubleshooting** (L1,L2)



Evaluation Level 1 – 1 h

Evaluation Level 2 – 1,5 h

Festo / WS **Certificate Skills Challenge Mechatronics**

Skill #48 – Industry 4.0 Reg. 17 Teams

WSOS / Job Competencies

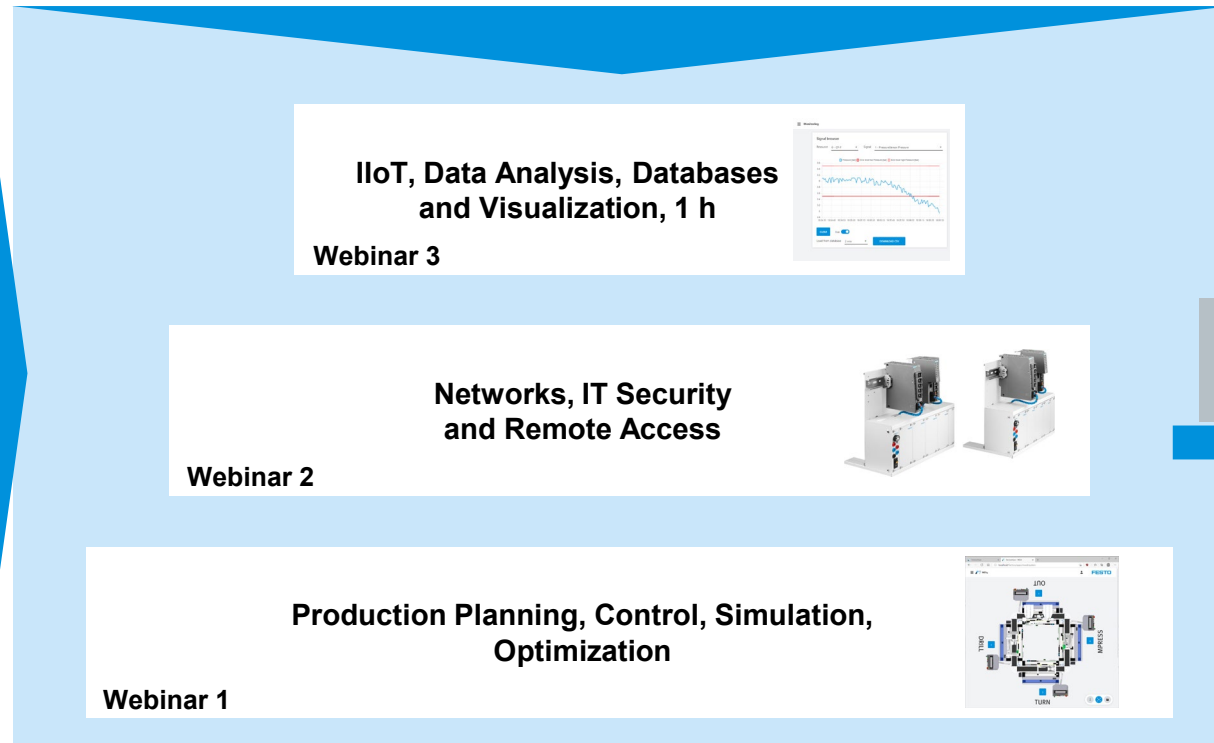


STEP 1: Capacity Building / Training Industry 4.0

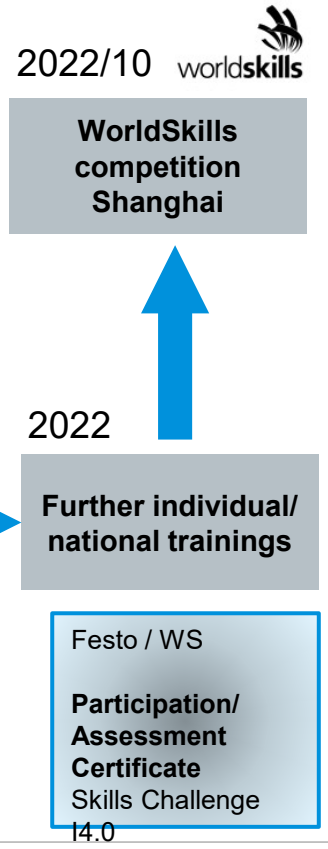
Selected competencies to be deepened for Skill #48 via Online Trainings, Webinars (Quarter 4, 2021)

Best practice (WSOS):

- Work organization and management
- Communication and interpersonal skills
 - Teamwork
- Design, assembly, and commissioning
 - Hardware design and commissioning to meet cyber-physical requirements
- Software design and implementation
 - Develop software solutions to handle specific jobs in production process
- Networking and cyber security
 - Ensure secure data exchange between production cells
- Testing, maintenance, and fault-finding
 - Use of augmented reality and other emerging technologies and tools
- Enhancement and optimization
 - Reduce costs by removing waste and consumption



2. Step Challenge



Skill #48 – Industry 4.0 Reg. 17 Teams

STEP 2: Online Hybrid Challenge “Virtual Production” (Quarter 1 and 2, 2022)

Equipment:

- MES4, CIROS, Machine Learning, + Freeware, Open Source
- NetLab

Covered Topics

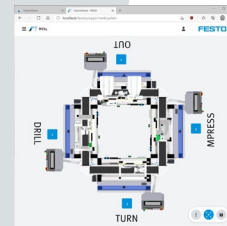
- Production planning and control
- Simulation and Optimization of manufacturing
- Database analysis MySQL
- Encrypted data connection via VPN
- Industrial communication via MQTT
- Edge computing with Node-RED
- Energy data analysis
- Creation of dashboards
- Training and application of machine learning algorithms

Challenge procedure:



1.
Tasks on LX are released for a given working time (e. g. 3 h) within a given period (e. g. 24 h)

2.
MES, Prod. Simulation
Application of Festo on participants' PC, **MES 1 h**



3.
IT Security
Application of network hardware for several tasks, **NetLab 1 h**

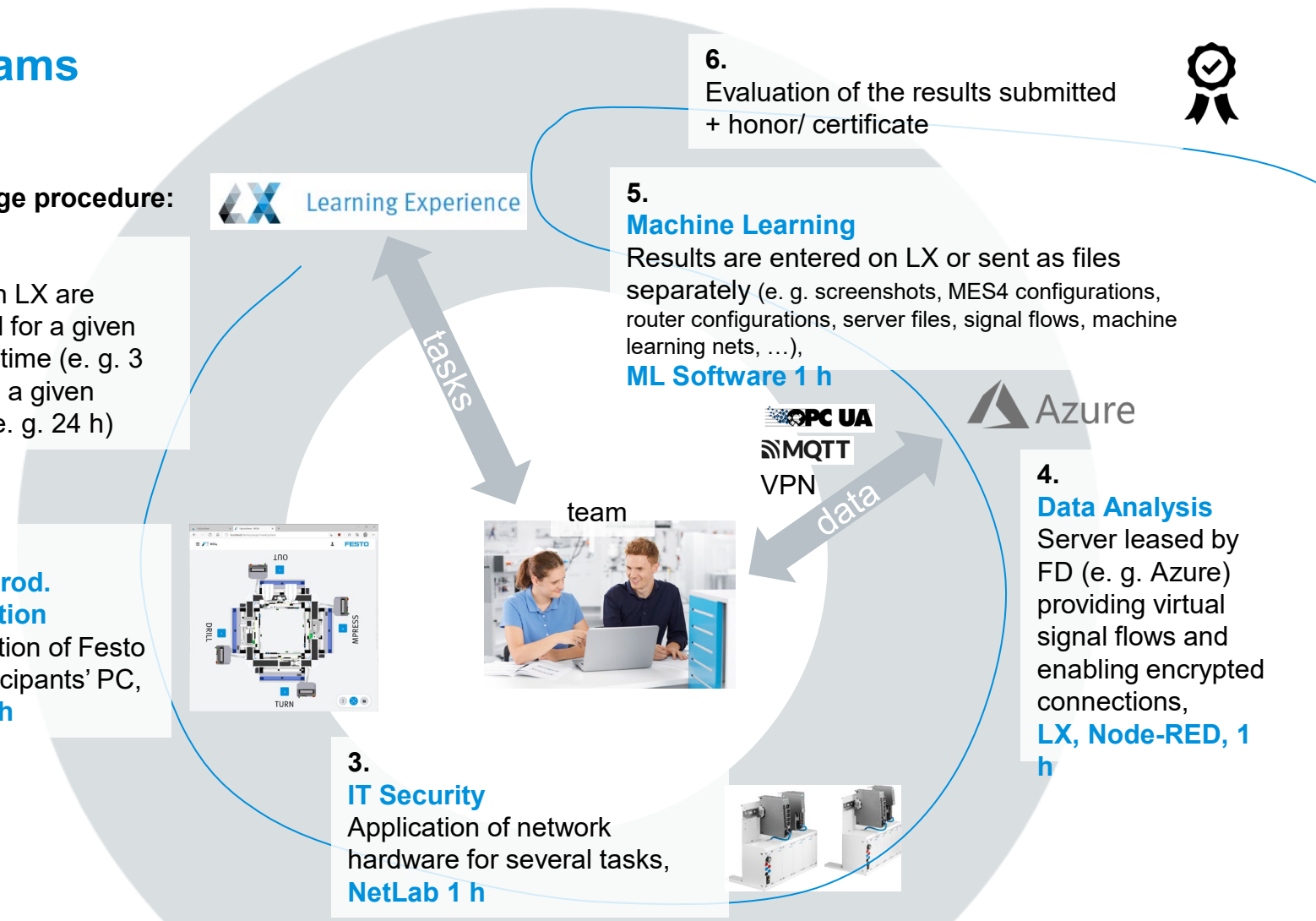


5.
Machine Learning
Results are entered on LX or sent as files separately (e. g. screenshots, MES4 configurations, router configurations, server files, signal flows, machine learning nets, ...), **ML Software 1 h**

6.
Evaluation of the results submitted + honor/ certificate



4.
Data Analysis
Server leased by FD (e. g. Azure) providing virtual signal flows and enabling encrypted connections, **LX, Node-RED, 1 h**



Skill #55 - Water Technology Reg. 17 Teams, 14 Experts

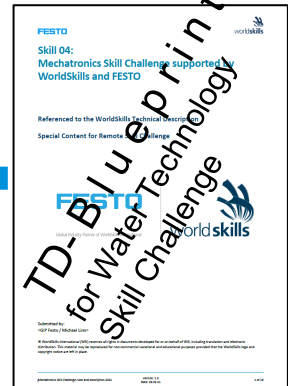
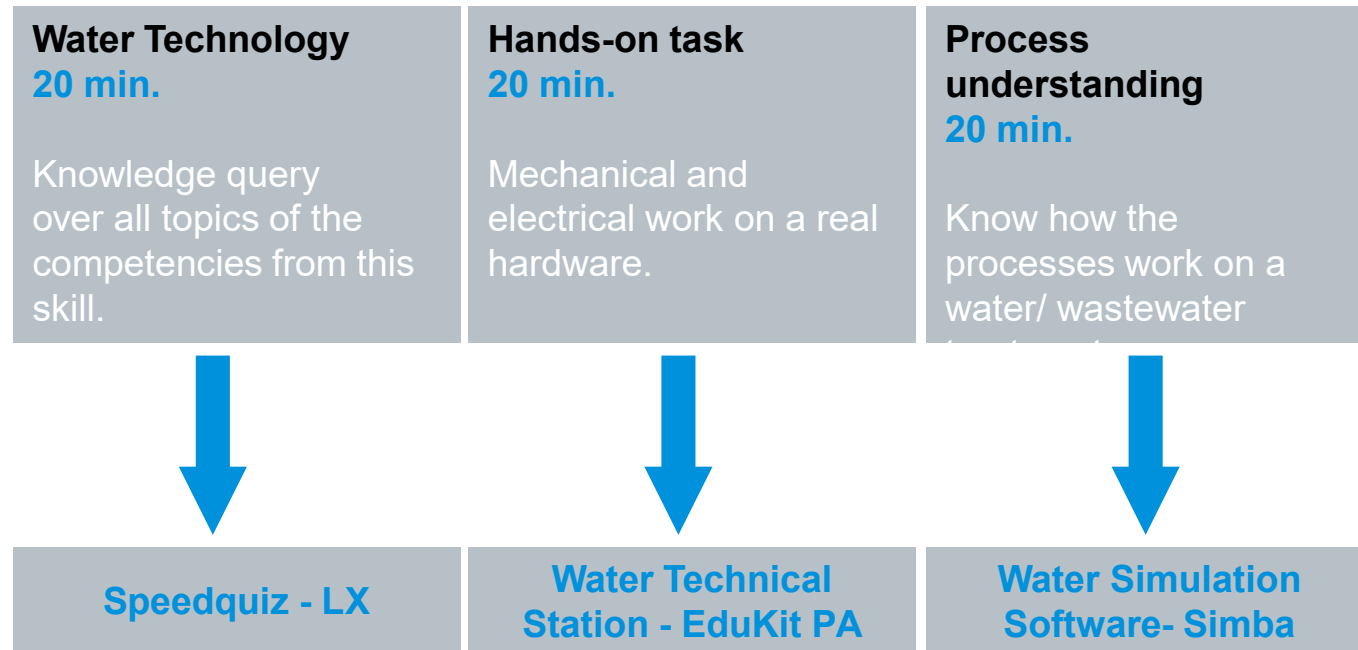
WSOS / Job Competencies and topics for the Skill Challenge



Best practice (WSOS):

- Work organization and management
- Communication and interpersonal skills
- Electrical/Mechanical
- Environment Protection
- Chemical/Biological – Quality Assurance
- Automation and documentation
- Application of health and safety

Selected Competencies to evaluate during the Skill Challenge



Festo / WS
Certificate Skills Challenge
WT



Lesson Learnt from Festo for WS community – ‘30 years Partnership Celebration’

- What was planned and worked well?
 - What was planned and didn't work well!, Why?
 - What wasn't planned but could be of good idea for the future endeavor?
-
- **140 WorldSkills Competition (WSC) Experts – Manufacturing out of approx. 300** have registered, actively use Festo LX within their work and teaching

