

**For the first time, mechatronics trainees of the MTR-171 class took part in a project on the topic of Industry 4.0 in cooperation with the future workshop of the Mercedes-Benz plant in Bremen. The apprentices produced a model of a so-called Smart Factory, built a robot car with camera for an Erasmus project and filmed the production process. But that's not all - the new "Europa Explorer" will be sent on an exciting mission in the future.**

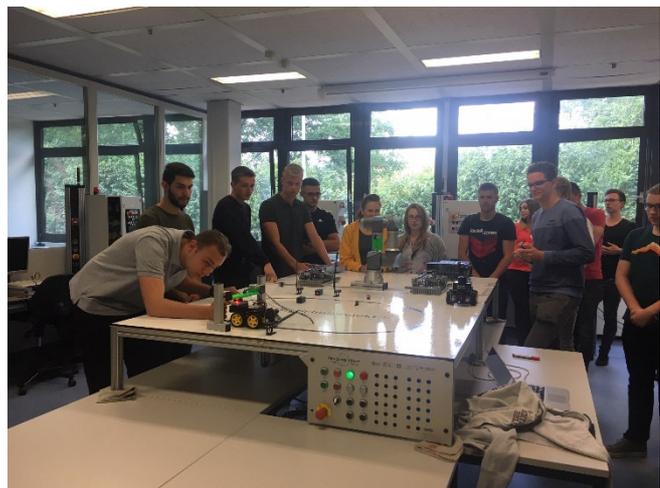


First Scratch of the production plant

During the first brainstorming session on Learning Field 6: Planning and Organizing Workflows, the learners already realized that a real product could be created through their bundled competencies and the given infrastructural possibilities. Based on the new framework curriculum for dual mechatronics training, they developed a project structure plan for smart production from these initial ideas, which was then implemented in cooperation with the future workshop of the Mercedes-Benz plant in Bremen as part of a learning location cooperation. The result is a model of a networked and highly flexible production process consisting of a driverless transport system (AGV) as an equipment carrier, a collaborative robot for removal and assembly, and two conveyor belts made of industry-related components. The Smart Factory was controlled by a Siemens S7-1500 (SPS). For the control of the FTS, the current Arduino technology from the modular system was used. "This kit is not an industry standard, but due to the Arduino technology it is

very popular with the trainees! ", says vocational school teacher Michael Graf-Jahnke.

As befits a project in the field of industry 4.0 or IoT, Internet of Things, in which physical and virtual objects are networked and collaborate, the learning platform "Itslearning" supported the project teams in communication and connection of the learning locations company, school and home (blended learning). Conclusion: The students have not only dealt with networked production processes and additive manufacturing processes (3D printing), but have also learnt to find their way in an interdisciplinary working method of teams. The basis of this learning field



Learners of the class MTR 171 at the presentation of their project at the future workshop of the Mercedes-Benz plant in Bremen

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Final model of the smart factory at the future workshop of the Mercedes-Benz plant in Bremen

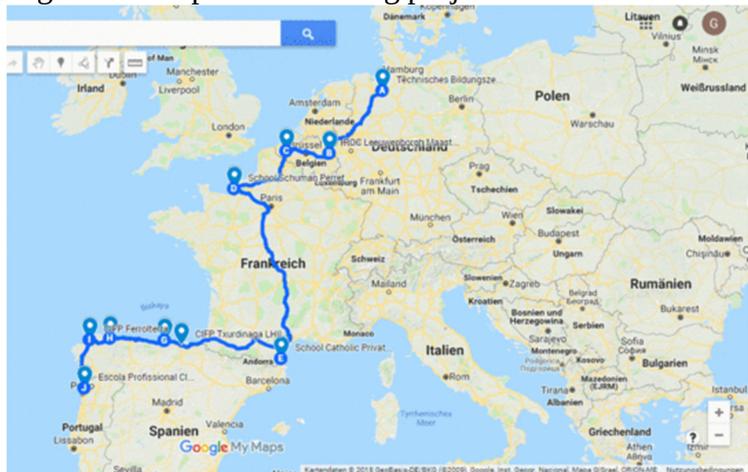
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Conclusion: The students have not only dealt with networked production processes and additive manufacturing processes (3D printing), but have also learnt to find their way in an interdisciplinary working method of teams. The basis of this learning field instruction was a learning and work task that summarized the competencies from the areas of control technology, robotics and project management as well as their interfaces. An image film about the production process has also been produced and will be published shortly. For this reason, the driverless transport system was modified into a camera drone (robot car). The pupils were rewarded with a presentation of their

results in the training workshop of the Mercedes-Benz plant in Bremen.

"Such trend-setting projects should be able to be carried out with all MTR classes," says Michael Graf-Jahnke, who has also applied for funding for a European eTwinning project with the robot car.

It is planned to send the "Europe Explorer", which got its name from the Mars Explorer, first to a Dutch vocational school. "The idea is to put it in a package with a message in it: Show us what you do, what skills you have, how you are equipped with the mechatronics field," explains the vocational school teacher. Results would then be exchanged on Twinspace, the network for European schools.



Planning of the Europa Mission so far

In a further step, cooperation with partner schools could be developed, which would make student exchanges and internships possible, wishes Michael Graf-Jahnke. "Of course, we as the MTR team are still at the beginning of a future school workshop with such an interdisciplinary project, but we suspect that there is enormous potential for synergy effects which make it necessary to consolidate the acquired learning and work tasks in further projects.