Learning for practical application: Planning and creatively implementing assembly line systems

Hof University, Hof / Bavaria (Germany)

Research / Application: Engineering, Modular bachelor's degree in industrial engineering,
Major in digital factory | Deployment Period 2025

THE CHALLENGE

In modernen, automatisierten Montagesystemen wirken zahlreiche mechanische, elektronische und digitale Komponenten eng zusammen. Für einen stabilen und effizienten Betrieb ist es entscheidend, dieses Zusammenspiel ganzheitlich zu verstehen. Dazu gehört Prozesse, Schnittstellen und Steuerungsparameter frühzeitig festzulegen und aufeinander abzustimmen. Gleichzeitig stellt sich die Frage, wie sich im laufenden Betrieb Schwächen, Störungen oder Fehler systematisch erkennen, analysieren und bewerten lassen, um Optimierungspotenziale gezielt ableiten zu können.

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People learn best and most sustainably from their own experiences. That's why we create an experiential space where students can design technical processes and bring them to life, while also experiencing teamwork, responsibility, and reliability. This motivates them to realize that they can really make a difference.

Prof. Valentin Plenk, Ph.D.,
Lecturer

THE SOLUTION

In the teaching module, we gave 20 students a clearly defined task based on real-world challenges. The solution itself was deliberately left open at first. This created space for the students to independently analyze, design, and implement the interaction of processes, components, and interfaces.

Teachers supported this process and were on hand to answer technical and methodological questions without prescribing the solution. The students studied the mechanics of the system and then programmed the future process using PLC programs. This was implemented as assembly line production with the help of fischertechnik. Regular reviews structured the project work and helped to keep the overall goal in sight. This also encouraged continuous reflection on their own approach. In the process, the students learned to critically question their decisions, weigh up alternative approaches, and justify their solutions on a technical basis. In this way, not only is technical understanding of modern flow production systems strengthened, but also independence, reflective thinking, and the ability to present one's own solutions in a convincing manner. The teaching module will be offered again at Hof University of Applied Sciences in the coming summer semester.

THE RESULT

Each semester is characterized by new perspectives and surprising developments, accompanied by satisfied and proud students. This setting has a lasting motivating effect. The deliberate avoidance of prescribing solutions encourages independent work and creative thinking processes. Technical and didactic support helps students overcome technical problems and draw conclusions from their experiences.

FIT FOR FUTURE
WITH FISCHERTECHNIK!

The production of tomorrow is the focus of research, industry, and academia. It describes the transformation towards agility, customer orientation, artificial intelligence, and Industry 4.0. This gives rise to a multitude of challenges influenced by technological advancements, societal changes, and global trends. Addressing these challenges requires a holistic and proactive approach from companies that invest in innovation and employee training to successfully shape tomorrow's production and remain globally competitive.

Therefore, our approach is to understand the small before implementing on a large scale. With fischertechnik simulation models, you prepare yourself for the future, create sustainable learning experiences in vocational education and academia, overcome hurdles presented by seemingly complex transformations, and conduct research on future topics.

"The project showed me how complex modern flow production really is and how important clear agreements and clean processes are. Taking responsibility and advocating solutions was particularly valuable. I will definitely benefit from this in my future career."

Daniel M., Student