

Strategies Beyond Borders – Transforming Higher Education in a Digital Age

Proposal for the Contribution „SLiCE“ in the Cluster Innovation in Teaching & Learning

SLiCE (Scenario-based Learning in Cooperative Environments) stands for cooperative, distributed laboratory use between the Rheinische Fachhochschule Köln (RFH) and its international university partners (in this scenario two institutions in Indonesia and Rwanda). At its core, **RFH laboratory facilities are used telematically by students at foreign universities** in the teaching context. Examples are the programming of an automatic bottle filling system, the control of a robot or the programming of microcontrollers within a corresponding experimental application scenario.

This work is integrated into a **practical and job-oriented** scenario consisting of online lectures and exercises, which the students of both partner universities also carry out together in a self-learning mode and which prepare them for the practical implementation of the experiment described above. This experiment is therefore **staged as a time-based challenge** in which transnational student groups have to form in order to **solve technical problems** with high precision in the shortest possible time. They are not only supported by their subject teachers, but also **coached by experts from cooperating companies** to secure the practical relevance.

At the technical level, the program development and control computers abroad are networked with those of the RFH systems. A **video transmission** secures the visual return channel to the foreign students and communication and instruction takes place in a **Virtual Classroom** (currently Adobe Connect). In addition, a "**digital twin**" of the RFH system is made available to the students of the partner universities via **Virtual Reality**.

This scenario just described is the **practical core of a project module** jointly conducted by the partner institutions. This in turn is part of a successively intensified, curricular entanglement, which finally should lead to a **double degree**.

The path to this double degree leads through **certificates** with 15 or 30 credit points each, which can also be booked by people interested in **continuing education** who are not looking for a degree, but are looking for acquiring skills they need for their job.

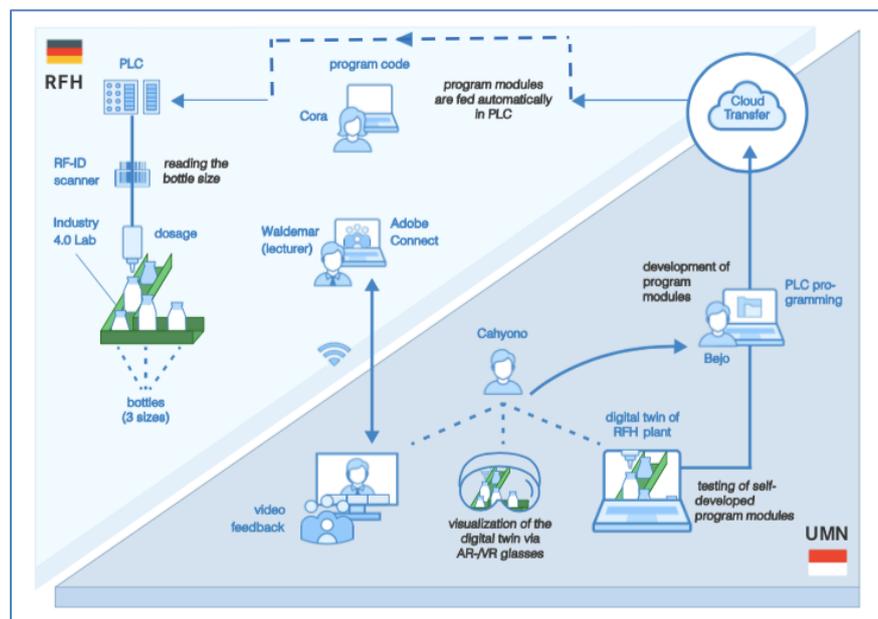


figure 1: visualization of the cooperative laboratory use

The implementation of joint online-based lecture modules (in addition to the project module described above) serves different purposes:

- New, international perspectives and experiences (**internationalisation at home**) emerge for the students,
- the requirement for a **practical and job-oriented study** can be better fulfilled at all institutions, since the effort (eg for acquisition and operation of an innovative laboratory) is minimized and the - also practical - competencies for international Co-operation are taught,
- The use of a common basis of online learning units, which is supplemented with university-specific classroom appointments, almost automatically leads to the application of the "**inverted classroom principle**" - a didactic goal of the partners.
- telelectures, in which the teachers of the other university take part (easier than attending live classes), are an excellent basis for learning through observation ("looking over the shoulder of colleagues") and for professional didactic feedback. Thus, these televised lectures are a basic element for the "**train-the-trainer**" approach of the SLiCE project.

The digitisation approach described above (here: in an international setting) represents the continuous further development of online-based elements (e-learning) in the teaching of the RFH. For many years, the RFH has been offering time- and spatially independent learning through digital learning and media formats. They are an essential **quality building block**, suitable for compact study courses with small student groups, close contact to specialist lecturers and the consistent connection to the requirements of the economy. This applies in particular to part-time courses of study and certificate degrees.

SLiCE builds on the fundamentally practical and job-oriented academic concept of the RFH and uses digital technologies to **supplement the traditional university teaching** at the partner institutions in a complementary way.



figure 1: students learning in the automation laboratory

Köln, den 10.09.19
SLiCE project team