Transformative Learning in Inland Waterways Education with Simulators and Digital Innovations on DANUBE and RHINE

Dipl.-Ing. Angelika Voit
Deputy Headmaster, Schiffer-Berufskolleg RHEIN,
Duisburg/Germany
28th of January 2026

Co-funded by the European Union
Federal Ministry for Digital and Transport

Topics presented

- Education for Inland Waterway Transport in Vocational Education Training (VET/Dual Systems)
- Connecting of Inland waterway navigation Simulators for a common education on Danube and RHINE
- Developing new Learning Paths (ARIELL project)
- Conclusion
- Outlook

Co-funded by the European Union
Federal Ministry for Digital and Transport

Introduction/Background

New national regulations since 2022 based on DIRECTIVE (EU) 2017/2397 of the European Parliament and Commission Delegated Regulation (EU) 2026/118 of 7 November 2025

Important results:

- ➔ Simulators accepted for examen and training
- ➔ Same level of exams according to the table of competencies

But:

- ➔ Integration in education systems of the countries are different.
  - EQF 4/5 (Germany) up to EQF 6 (Romania)
  - Dual System (Germany) vs. Fulltime (Romania)

Co-funded by the European Union

Vocational Education Training (VET) - Dual system

Dual System

- Main part (2/3) in company (practise) => contract with the company
- Minor part (1/3) in vocational college (theory)

Regions of the dual system

- Companies in different parts all over the German language areas (Germany, e.g. Switzerland)

Aspects for Rhine/Danube regions:

- In companies located along the Danube and/or steering on Danube
- Specific requirements for the Danube taught by companies
- In theory focus at school on Rhine but partly Danube as well

Co-funded by the European Union

Vocational Education Training (VET) - Dual system

Duration of education in Inland Waterway Transport:

- Helmsman: three years
- Boatmaster: three and a half year

Focus of examination by the Chamber of Industry and Commerce (IHK):

- Helmsman: technical focus (steering time 360 days within the education)
- Boatmaster: nautical focus (steering time 360 days within or after the education)

Co-funded by the European Union

Dipl.-Ing. Angelika Voit

Dual system - key aspects

Focus of inland waterway transport companies = training time for practical tasks on board

- Specific to the tasks and areas of the companies (e.g. North-South, East-West, Danube-Rhine)

Focus of the lesson time at vocational college (SBKR):

- Knowledge and skills in theory and practice
- A kind of „melting point“ with students from companies all over the German spoken regions e.g. from Rhine and Danube (as the main „backbone“ of the IWT in Europe)

Co-funded by the European Union

Dual system - Conclusion

Based on a coordinated training plan for the **companies and** the corresponding framework plan as well as the annual didactic planning on the part of the **vocational college**, the **close cooperation and coordination** of the dual partners ensures that all key aspects regarding similarities and differences in work tasks or the influences of regional characteristics are addressed.

Co-funded by the European Union

Implementation of harmonisation – despite differences in education systems

Launch by EDINNA: Development of learning and examination content in Erasmus projects (e.g. IWT-Comp, Competing, 1St4IWT)

Project: ARIELL

- Real sailing areas on both the rivers Rhine and Danube
- In respect to different EQF levels and education systems (Dual system vs. full time education at university)
- Developing E-Learning material for common training in IWT
- First step to international harmonised common lessons
- First Connecting of Inland Waterway Navigation simulators (UCV and SBKR) supported by Federal Ministry for Digital and Transport

Co-funded by the European Union

Connecting of Full mission bridges Simulators (UCV and SBKR)

Foto: Simulator UCV

Foto: Simulator SBKR

Co-funded by the European Union

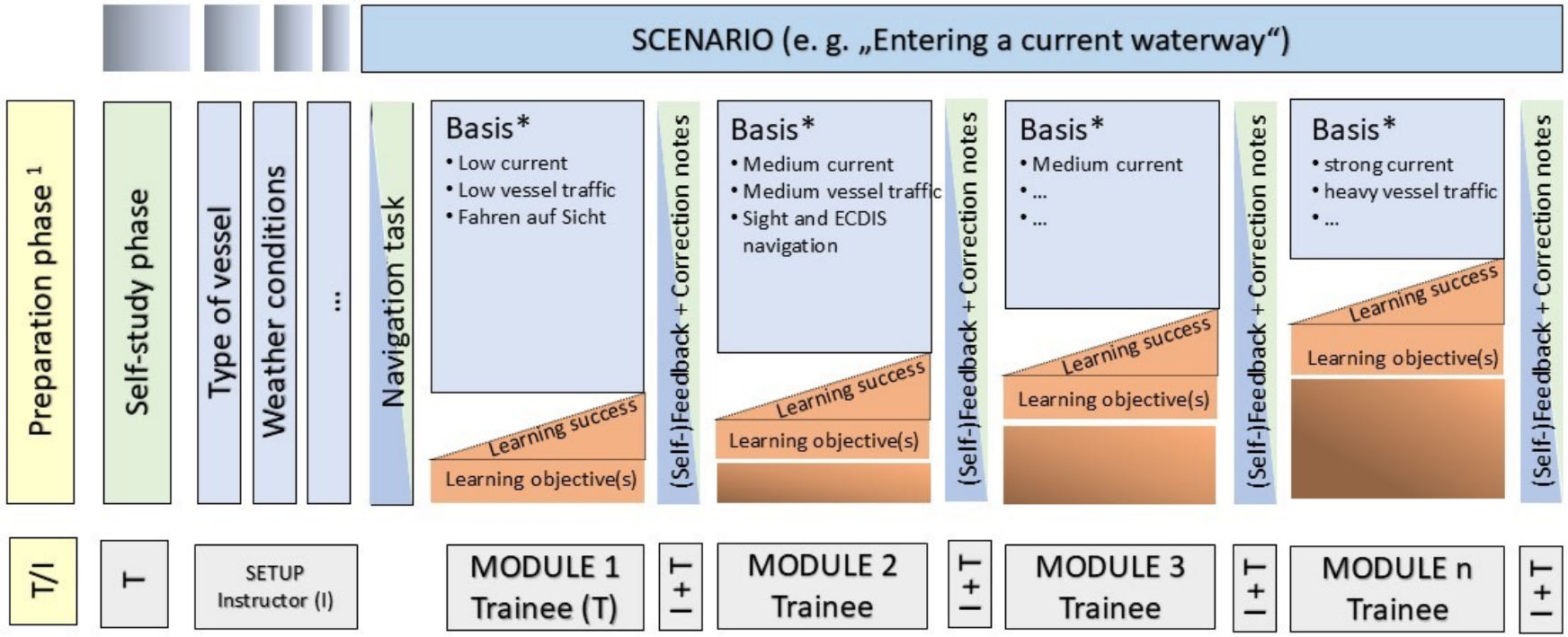
Dipl.-Ing. Angelika Voit

Connecting of Simulators: Benefits

- **Simulated situation on board more realistic**
  ➔ bridge training more realistic (communication, meeting other vessel), especially if you have a simulator with one bridge
- **Connected simulators = meetings with other vessels (own/foreign) as on rivers in reality**
  ➔ vessels controlled by skippers of different nationalities
- **Support from different locations included**
- **Better chances to train difficult or critical/dangerous situations in cooperation**
  ➔ inland waterways become safer
- **Preparing trainees together for examen**

Co-funded by the European Union
Federal Ministry for Digital and Transport

Basic structure of a scenario with online learning and simulator modules



[1] Input: Individual knowledge and skills, competencies already acquired.

* Specific details related to the example scenario exemplary!

Co-funded by the European Union

Conclusion ARIELL:
Opportunities for optimised vocational training in IWT

- Common online learning material
- Boosts learners' self-confidence and sense of responsibility in a safe environment.
- Enables trainees to achieve their learning goals or gain experience through individual learning paths that take into account their individual learning behaviour and learning abilities.
- Independent, individual, and exciting learning ("gamification") in a practice-oriented professional environment.
- Relieves professional instructors/trainers of routine operational tasks, creating more time/ freedom for individual guidance, practice, and feedback when supervising learners.
- Enables trainees to learn more efficiently.

Co-funded by the European Union

… and a brief Outlook

- **Integration of “new/other”, current topics into simulator training**

  ➔ e. g. “Decarbonising“/”Greening”: Reducing fuel consumption and carbon footprint by adjusting nautical navigation in IWT.

- **Integration of simulators from different manufacturers**

  ➔ better coordination of Inland Waterway Transport training in European training facilities and better training of communication between crew members of different countries.

Co-funded by the European Union

Dipl.-Ing. Angelika Voit

… Now it is time for questions

Co-funded by
the European Union

Dipl.-Ing. Angelika Voit