

# Excellence Network Vocational Education for Sustainable Development in Europe

KA2 Small Scale Project



Co-funded by  
the European Union

Hydrogen - a future topic in excellent vocational education for sustainable development (VESD)

## Documentation of learning arrangement

|                                               |                                                                                                                  |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Topic:                                        | Train the Trainers for Vocational (Resource) Education with AI for Teaching Hydrogen                             |
| Network partner:                              | IZT                                                                                                              |
| Vocational Field of the Learning arrangement: | General                                                                                                          |
| EQF:                                          |                                                                                                                  |
| Learning group:                               |                                                                                                                  |
| SDGs:                                         | 4. Quality Education<br>7. Affordable and Clean Energy<br>9. Industry, Innovation and Infrastructure             |
| Future skills:                                | <ul style="list-style-type: none"><li>Digital literacy/Digital proficiency</li><li>Understanding of AI</li></ul> |

### Description of learning arrangement:

The lesson unit includes an introduction to the use of artificial intelligence in conjunction with teaching basic knowledge about the use of hydrogen. The lesson unit is designed to last 4 hours and includes PowerPoint presentations, online videos, surveys, tasks, tests using Google forms, and discussions about AI and hydrogen.

- Part 1: Welcome & Check-In: Workshop overview, introduction of the speaker (Dr. Michael Scharp) and his projects (e.g., BilRess, WAVE). Technical check-in (MS Teams, Google Classroom).
- Part 2: Presentations of the Participants: Getting to know each other: Introduction of participants and their everyday and professional use of AI ("AI-Biography").
- Part 3: Benefits and Risks of Using AI (in VET): Discussion and evaluation of the advantages and risks of using AI in vocational education and training (e.g., personalized learning vs. loss of critical thinking).
- Part 4: Basics of Artificial Intelligence: Lecture: What is AI? Definitions (Human vs. Artificial Intelligence), Neural Networks, Pre-Training, Fine-Tuning, and the distinction between Weak and Strong AI.
- Part 5: VESD and Hydrogen: Lecture: The framework of vocational education in Germany and the integration of hydrogen into existing occupational profiles (e.g., Plant Mechanic). The new standard "Environmental Protection and Sustainability."

- Part 6: Teaching Hydrogen – Traditional and with AI: Use of AI for integrating hydrogen into teaching. Presentation of the finished OER teaching material on hydrogen. Exercises on prompt formulation and research for teaching materials.
- Part 7: Your Personal RAG-Advisor: Lecture & Workshop: Comparison of RAG vs. Fine-Tuning vs. Prompt Engineering and instructions for creating your own RAG-Chatbot (Steps 1–8).

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