

## MARLA: Masters of Malfunction

MARLA is an educational game with which trainees in metal and electrical engineering can practice fault diagnosis. The game was developed for use in vocational school lessons and in inter-company training centers. The trainees learn the various steps of fault diagnosis on an offshore wind turbine - directly in the classroom using virtual reality on the Meta Quest.

### Main Objectives

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- **Mastering Fault Diagnosis: Elevating Apprentices with VR Excellence**  
Develop a Virtual Reality game to foster the fault diagnosis competence of apprentices in the electrical and metal engineering fields.
- **Orchestrating VR: Enhance Vocational Training with MARLA's Magic**  
Create an integrated learning experience with accompanying didactic material and evaluation to support the application's effectiveness in vocational school instruction.
- **Wind Power Unleashed: The Exciting VR Training Experience**  
Provide a training tool that is engaging and relevant to the field, using an offshore wind turbine as a practical example.
- **Addressing Sustainable Learning Objectives**  
Demonstrating the capacity of virtual reality to create educational environments within the framework of education for sustainable development.
- **Integrating Game-based Learning**  
Investigating the integration of playful elements, narrative engagement, and simulated learning scenarios.

### Added Benefit of Use in TVET

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- **Bridging the Gap**  
Address the gap in effectively applying fault diagnosis knowledge among skilled workers in these professions.
- **Real-World Simulations**  
VR allows for realistic, real-world simulations, enabling trainees to practice and apply their skills in a safe and controlled environment.
- **Personalized Learning**  
VR applications can be tailored to the specific needs of individual trainees. Adaptive features and assessment tools can provide personalized feedback and support, helping learners progress at their own pace.
- **Using unique Affordances of VR to Enhance Vocational Education**  
VR provides a highly immersive and interactive learning experience, which can significantly increase trainees' engagement with educational content. The hands-on, experiential nature of VR can make learning more enjoyable and motivating.

## Getting started

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- **Step 1: Analyze**  
Setting up the development process in line with the ADDIE model by Branch (2009): Analyze target groups needs and specification.
- **Step 2: Develop**  
Develop learning objectives and learning content. Decide for a didactic-methodological approach, quests and interaction.
- **Step 3: Design**  
In close collaboration with professional Game Designers develop a prototype and test it within the target group before finalizing it.
- **Step 4: Implement**  
Implement the prototype into practise.
- **Step 5: Evaluate**  
Each step of the development process is evaluated to examine if learning content and learning objectives are promoted

## Profile of Provider

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The project MARLA was developed within an interdisciplinary research project, funded by the German Federal Ministry of Education and Research (BMBF). Under the leadership of Dr. Pia Spangenberg (TU Berlin). The team consisted of learning psychologist Dr. Felix Kapp (TU Berlin), pedagogues Nadine Matthes (TU Berlin), craft chambers experts Markus Kybart (Handwerkskammer Osnabrück-Emsland-Grafschaft Bentheim), Kristina Schmidt (Handwerkskammer Koblenz), and the Game studio the Good Evil under the direction of Prof. Linda Kruse. It was developed over a period of three years in an interactive project design manner.

## Contact

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The **International Roadshow ‘Use of Digital Media in TVET’** has been initiated by the **Federal Institute for Vocational Education and Training in Germany (BIBB)**.

The format aims to show the potential of digital applications and technologies for teaching and learning in TVET and identify viable solutions for their sustainable integration into TVET practice. In the context of digitalisation and technological change across all areas of life, the use of digital media is also growing in significance for the TVET system. Digitally supported education and training can help to strengthen individual skills and competencies for the beneficial and responsible use of digital technologies in all areas of life, make learning more flexible and enhance the quality and attractiveness of TVET.

The format builds on the German Roadshow „Digital Media in TVET“, which has been successfully implemented and conducted since 2016 by the Federal Ministry of Education and Research in Germany (BMBF) in cooperation with BIBB.

You can find more background information on the initiative, selected projects and future events on the website: <https://www.bibb.de/en/182468.php>