

## 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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## SENAI Experience

SENAI Experience is a revolution in vocational education, enriching learning with extraordinary benefits. Through simulations and virtual reality, we offer a practical environment, allowing students to hone their skills safely. With internet access, we eliminate geographical barriers, democratising access to quality resources. By joining SENAI Experience, students gain practical experience, in-depth understanding and, above all, the confidence to face the real challenges of the world of work.

### Main objectives

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- **Providing Immersive Learning**  
Explore practical environments and experiences through simulations and immersive technologies, making learning more engaging and meaningful
- **Accessibility**  
Eliminate geographical barriers by offering access to resources via the internet, allowing students to practise from anywhere.
- **Promoting Collaboration**  
Connecting students, teachers and professionals, encouraging collaboration, the exchange of knowledge and teaching practices and the development of immersive resources.
- **Preparing Professionals for the Real World**  
Empower students with practical experience, enabling them to face real challenges in their future careers with confidence and mastery.
- **Transforming vocational education**  
Redefining learning through innovative approaches and cutting-edge technologies such as virtual, augmented and mixed reality, moulding the next generation of professionals ready for the modern world.

### Additional benefit in TVET

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- **Practical Learning**  
It provides hands-on experiences and real-life simulations, allowing students to practise real-world skills and procedures.
- **Flexible Access**  
It offers the flexibility to learn anytime, anywhere, using online technologies, eliminating geographical barriers.
- **Collaboration**  
Connecting students and professionals in professional education, promoting collaboration, the exchange of knowledge and the construction of a teaching network using immersive resources
- **Preparation for the labour market**  
To develop students' skills and competences that are directly applicable to their future careers, making them highly prepared professionals, including those able to incorporate new technologies.

## First steps

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- Step 1: Go to: <https://experience.senai.br/>  
Visit our website
- Step 2: Check the highlights  
Access featured resources without the need to register, at the bottom of the home page.
- Step 3: Register  
Register to access the complete library of immersive resources
- Step 4: Incorporate into your lessons  
Access the resources, consult support materials, include them in your lessons and use them with students
- Step 5: Share

Register new immersive resources to help the community grow

## Provider profile

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The National Industrial Apprenticeship Service (SENAI), established in 1942 by the National Confederation of Industry (CNI) on the basis of Decree-Law 4.048/42 and the 1937 Constitution, has played a fundamental role in the training and development of the industrial workforce in Brazil.

The institution's mission is to promote vocational and higher education, innovation and the transfer of industrial technologies, thus contributing to raising the competitiveness of Brazilian industry and transforming lives. SENAI is dedicated to the creation and execution of professional education programmes, as well as the technological development of industry, playing a crucial role in the progress and strengthening of industry in Brazil.

## Contact

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## SuperLab Terra do Sol: an integrative project that contextualises technical knowledge, digital games and artificial intelligence in retail service learning at SENAC, Natal, North Zone

The project presented enabled the students involved to develop skills related to digital autonomy, knowledge building, a collaborative attitude, sustainability mindset, the promotion of social inclusion actions devised in the project's conception, innovation from the incorporation of artificial intelligence associated with the proposed solutions, as well as making use of the technical knowledge learnt in an integrative way, based on can-do culture, from the stimulus to the use of augmented reality provided by the use of Minecraft Education Edition with the development of the project carried out in a total of 56 hours of targeted activities.

### Main objectives

- Collaborative learning
- Developing vocational education competences
- Use of technology/tools to enhance learning
- Digital skills and competences needed to develop students in education vocational
- Sharing and access to other students
- Inclusion of educational, social and environmental themes in the project

### Additional benefit of TVET use

- Innovative experience using Minecraft for learning in vocational education
- Dynamic learning
- New practices for the trade sector
- Stimulating the construction of knowledge in a virtual environment  
Encouraging the use of the virtual environment, based on Minecraft Education Edition, as a tool for developing

technological competences and associated technical knowledge.

- Promoting a systemic vision of society  
Technically innovative solutions were implemented, based on social, environmental and technological

### First steps

- Step 1: Definition of the generating theme
- Stage 2: Establishing the division of teams into committees and team rotation
- Stage 3: Analysing case studies and proposing solutions using Design nThinking
- Step 4: Creating the Terra do Sol SuperLab in Minecraft Education Edition
- Stage 5: Presentation of the "Terra do Sol

## Provider profile

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The National Commercial Education Service (Senac) is nationally recognised for being the institution of tradition and quality in training Brazilian society for the labour market, especially in the trade, goods and services sector. It is an institution that has been in existence for over 70 years and whose main social objective is to train people for the world of work with qualifications, competence and social responsibility, and which is continually concerned with the use of innovative technologies to bring to the market the most contemporary and up-to-date commercial practices.

In Rio Grande do Norte, Senac plays an important role in training qualified labour for the job market, especially in its main area of activity which is the Management and Business segment, seeking to promote, through quality professional education, the insertion of professionals who are ever closer to the needs of the job market

## Contact

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## CONNECT

CONNECT is the online platform, promoted by Corporación Formados, which facilitates the tasks and processes of planning, monitoring and evaluating Dual Vocational Training. It facilitates interaction between the players involved in vocational education, such as: business associations, training companies, in-company trainers, students and higher education institutions. Through the platform, it is possible to have reliable, available, permanent and secure information.

### Main objectives

- Facilitate the exchange of information  
Connect makes each actor's information available to those who need it at the right time.
- Facilitating processes  
Companies, students, trade unions and educational institutions manage the operational processes involved in the dual training process in a more organised way.
- Promoting quality  
Thanks to standardised and optimised processes, all training are properly planned and managed, which leads to quality vocational training.

### Additional benefit of TVET use

- Indicators  
It is possible to have impact indicators, such as the number of trainees, companies and graduates, dropouts, satisfaction surveys, at a local or national
- Availability  
Information such as : training plans, evaluations, selection processes, etc. is available 24/7 to all players who need it.

- Centralised documentation  
The platform stores all the information from the practical phase, without the need for email, repositories and physical files.
- New working dynamics  
New ways of working are being established, which used to be more labour-intensive and time-consuming by hand.

### First steps

- Step 1: Applying for credentials  
Brief description: A request must be made to the Corporación Formados team for the creation of the key user.
- Step 2: Access  
Short description:  
<https://connect.formados.ec/> logs in to the system with the credentials provided.
- Step 3: Read the guide  
Brief description: The platform is very intuitive, but it has an interactive user guide to learn how it works.
- Step 4: Use  
Brief description: Once in Connect, you can use the functionalities according to your role....

## Provider profile

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CORPORACIÓN FORMADOS is a private, non-profit organisation that was officially set up on 19 October 2018 in accordance with Ministerial Agreement No. 18,169. Its aim is to promote dual vocational training in Ecuador, a methodology through which we seek to influence the social and economic development of young people and, at the same time, improve the productivity of the business sector. We seek to influence the transformation of the country's educational culture by promoting workplace training, which allows young people to have access to formal training and, more importantly, allows young people to have specific skills so that they can adapt to the changing conditions of the future of work and lead the adaptation of companies to the new production scenario.

## Contact

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Corporation formed

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## NR 11 Forklift Simulator

The forklift simulator project is an additional tool used during the practical lessons of the forklift operation course. It offers an immersive experience, allowing operators in training to practise driving, stacking and load handling skills in a safe environment before and during practical lessons. Users can learn to operate the forklift, perfect safety techniques and familiarise themselves with the controls, without the risk of real-world accidents. This project contributes to the training of qualified operators, optimising and saving time and resources.

### Main objectives

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- **Operation Skills Training:**  
The simulator provides a favourable environment for operators in training to develop and hone their forklift driving skills. By offering an immersive and interactive experience, operators have the opportunity to practise a variety of challenging scenarios and perfect their techniques before starting their practical lessons.
- **Safety promotion:**  
Provide a safe training environment where users can learn and practise safety procedures..
- **Reducing costs and risks:**  
Minimising the possibility of accidents and material damage, thus reducing the costs associated with training and avoiding real-world incidents, resulting in safer and more efficient operations.
- **Flexibility of use**  
The simulator also offers instructors the flexibility to use the tool as a valuable complement during practical lessons, especially at times when apprentices are waiting for physical equipment to become available. By incorporating the simulator into these time

### Additional benefit of using EFA

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- **Gamified Learning Path**  
The concept of gamification has been integrated into the simulator to motivate students and promote continuous progress. The learning path, structured in levels, encourages gradual student progress, rewarding progress by unlocking new challenges and content. By completing the trail, the student demonstrates a comprehensive understanding of the content, ensuring that all the skills and knowledge required for forklift truck operation have been absorbed. The gamified approach also promotes engagement, healthy competition and virtual rewards, which boosts students' motivation and continued interest in the learning process.
- **Diversity Forklift**  
The simulator can allow students to experience a variety of forklift models in addition to those available in face-to-face courses. This opportunity to interact with different types of equipment exposes students to a wider range of scenarios and challenges they may face in the field.

### First steps

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- **Step 1: Assembling the Equipment**  
Assembling the simulator equipment is a simple and quick task, following an intuitive and well-structured process. The

components. With clear instructions and an ergonomic design, the case can be assembled in just a few minutes, giving users the convenience of setting up the simulator anywhere they want.

- **Step 2: Start the Simulator Software**  
To start the simulator software, simply click on the application shortcut. After initialisation, the software displays an intuitive interface that guides the user through clear configuration options and simulation scenario selection. With a user-friendly interface and step-by-step instructions, users can quickly start their training sessions.
- **Step 3: Using the equipment**  
When using the equipment, the instructor plays a crucial role by guiding students through the simulator's operation and progress through the learning phases. Through close monitoring, the instructor offers personalised support, identifying

areas for improvement and encouraging the continuous enhancement of the operators' skills.

### Provider profile

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SENAI SP is a reliable partner for industry, offering high-quality training, access to research and development resources, and support for the adoption of innovative technologies. Its dedication to excellence contributes significantly to the advancement of the country's.

### Contact

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