

Exploring the Energy Transition in an Interactive Experience Lab

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The Experience Lab of the Institute for Sector Coupling in Hamm, Germany aims to aid the energy transition by raising awareness for renewable energies and encouraging students to consider a career in energy technology through innovative and interactive teaching formats.

„Human ingenuity is the ultimate renewable energy.“¹

Introduction

In Germany, the energy sector remains the largest source of greenhouse gas emissions, underscoring the need for a shift to climate-friendly and renewable technologies.² This transformation demands skilled workers, yet the energy and electrical engineering sector simultaneously faces the largest workforce gap among STEM fields.³ The Experience Lab aims to address this gap by informing and inspiring students and the public about renewable energies.

Method

For this purpose technologies such as Augmented and Virtual Reality (AR/VR) are employed to address diverse learning styles and foster situated learning processes. They may also enhance motivation through technology-related interest and gamified approaches.⁴ Integrating digital content with the physical environment allows the visualization of complex processes and systems⁵, for example comprehensibly rendering otherwise invisible energy flows.



Figure 1. Students getting to know different renewable energy producers through a VR application

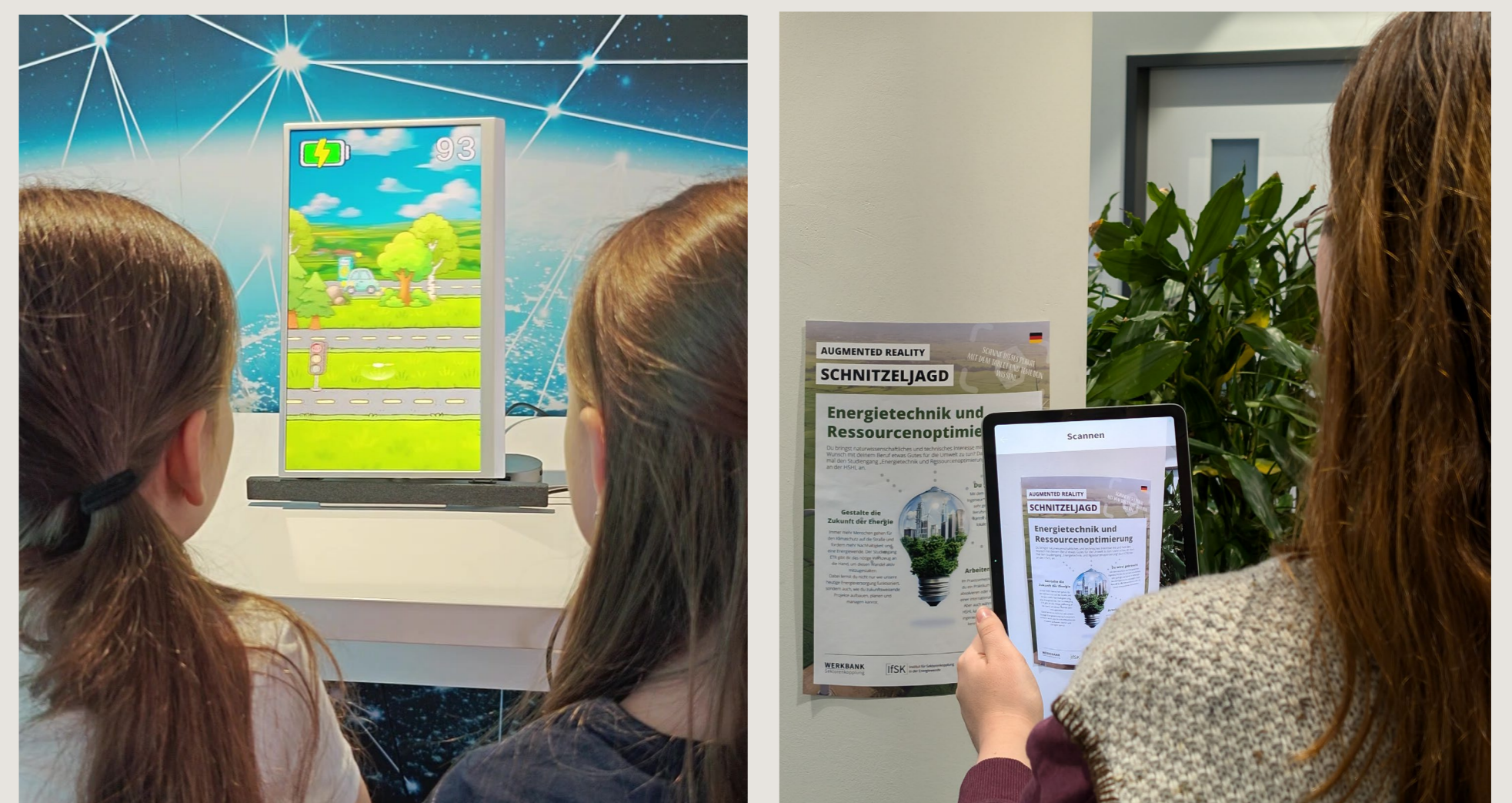


Figure 2. Applications for different ages utilizing gamification to grow interest in the topic of renewable energies

First experiences

The various formats and educational tools are designed to be diverse and tailored to different target groups. They range from an electric car race mini-game (*Figure 2, left*) to initially stimulate interest to a fully immersive virtual museum in which students can move around and learn about different renewable power generation methods independently (*Figure 1*). The activities take place in the lab itself, at local schools or events for the broad public. Since the lab was launched at the beginning of 2025, more than 400 students from grades five to 13 have already been welcomed.

Conclusion and Outlook

- Innovative methods such as VR, AR, and gamification have been successfully used as a medium for learning applications on renewable energies, aiming to reach diverse student groups and spark their interest.
- The future goal is to expand the applications and tools, address additional topics related to renewable energies, and evaluate their impact on students.

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