

Nursing training reinvented: Digital transformation as an opportunity and a challenge

Transforming nursing education at
the University Hospital Bonn (UKB)
with virtual reality



Reference project:

ukb universitäts
klinikum bonn

“With metaverse solutions like these, we can better train nurses. Trainees receive practical, yet scalable training units and can’t make a mistake in the virtual worlds. This allows them to enter their careers with greater confidence and experience.”

Dr. Christoph Sebastian Nies, Head of the school and spokesperson for the UKB Center for Vocational Training and further Education

As healthcare systems embrace digital technologies to improve scalability, cost-effectiveness, and learning outcomes, nursing education is going through a transformation as well. Traditional skillslab training has long been a foundation of nursing education. However, innovative solutions such as VR-based simulations offer great potential to complement physical skills-lab training as they provide realistic, scalable and location-independent training opportunities. The University Hospital Bonn (UKB) wanted advanced solutions that could combine safety and flexibility in preparing the next generation of nurses.

As part of the Innovative Secure Medical Campus (ISMC) project which is supported by the Ministry of Economic Affairs, Innovation, Digitalization and Energy of the State of North Rhine-Westphalia, UKB embarked on a digitalization journey to reimagine its training methods. Partnering with T-Systems Health and the T-Systems Innovation Center in Munich, the initiative wanted to harness immersive technologies such as Virtual Reality (VR) and Extended Reality (XR). This collaborative project transformed from inspiration and ideation to a fully implemented VR training platform that now enables cost-effective, practical, and safe nursing education, both in Germany and worldwide.



At a glance

- Digital transformation of nursing education under the Innovative Secure Medical Campus initiative
- Immersive VR-simulations offer realistic, scalable and location-independent training opportunities
- Development of VR-based training software with virtual patient rooms, avatars, and AI-supported interactions
- VR headsets, controllers, mobile 5G-enabled training platform, immersive scenarios
- Scalable, repeatable, and safe training modules for nurses, including international deployment

Reference in detail



Customer pain points

UKB continuously seeks to align high-quality training with innovative educational approaches to meet modern demands. Traditional skills-labs are an essential part of practical nurse training but often limited in scale and resources. By complementing these settings with innovative learning environments such as VR-based simulations, hospitals can expand training capacity, enable more frequent and consistent practice, and strengthen clinical competence. This blended approach ensures high-quality care and enhances patient safety.

Another critical challenge is minimizing the risk of errors in real-world training environments. Such mistakes can jeopardize patient safety and often undermine trainees' confidence.

Moreover, the lack of standardized, repeatable training scenarios made it difficult to ensure consistent preparation for all students. This challenge extended beyond Germany, as UKB also sought solutions to train international nurses without requiring their physical presence. As Rafaela Sieber from the T-Systems Innovation Center put it, "It was crucial that the customer not only learn about the technologies theoretically, but can also experience them directly, test them, and reflect on them in exchange with experts. This very experience builds trust and lays the foundation for boldly embarking on new projects."



How T-Systems solved it

To address these challenges, UKB collaborated with T-Systems Health, the T-Systems Innovation Center, and partner OneBonsai to design and implement a VR-based immersive training solution.

The project began with an innovation workshop at the Innovation Center Munich, which became the catalyst for the entire initiative. The Innovation

Center provides a creative and inspirational environment where customers can explore new technologies, experiment with digital trends, and co-create ideas with T-Systems experts. During the workshop, UKB's team participated in:

- Inspiration sessions and keynotes highlighting cutting-edge XR and Metaverse trends
- A hands-on innovation tour where participants tested VR/XR use cases with real devices
- Co-creation and ideation methods such as design thinking to develop concrete training scenarios

This experience helped the decision-makers see the potential of immersive technology firsthand, align on a shared vision, and gain confidence to pursue a bold digital transformation project. The workshop also served as the foundation for preparing a concrete project proposal, moving the initiative from concept to implementation.

Following this co-creation process, the T-Systems team, together with partner OneBonsai, Telekom MMS, and the UKB team developed the training software with virtual patient rooms, avatars, and the associated nursing actions. The solution consists of a modular training platform that leverages VR headsets, handheld controllers, AI-driven patient avatars, and trainer interfaces. Training scenarios include wound care, vital sign monitoring, infusion administration, and pain evaluation.

The VR simulations provide a safe environment where learners can practice repeatedly without risk, while trainers can observe, guide, and interact with participants in real time—even across different locations. Technically, the system is supported by a mobile training case, which includes VR devices, a trainer's tablet, and a 5G router for flexible deployment. Through haptic feedback such as perceptible heartbeats via controllers, trainees experience a heightened sense of realism. AI integration further enriches the learning environment by giving patients voices and responsive dialogue.



Business impact

The introduction of immersive VR-based training has transformed nursing education at UKB by delivering a scalable, location-independent, and safe complement to traditional methods. With the new platform, training can be expanded without incurring proportional increases in cost or infrastructure, making it sustainable in the long term.

The virtual environments provide a safe space for learners to practice, experiment, and even make mistakes without real-world consequences. This not only contributes to ensuring patient safety but also helps nurses build greater confidence before entering clinical practice.

The use of AI-driven patient avatars and haptic feedback makes the learning experience interactive, engaging trainees in ways that go beyond traditional classroom methods. Moreover, it allows trainers to monitor and guide participants remotely, allowing for real-time feedback and support regardless of physical location.

The mobile VR training case enables the hospital to extend its reach and support international training efforts for fostering collaborative learning across borders. By adopting these technologies, UKB not only keeps the quality of nursing education up high but also establishes itself as a leader in the digital transformation of healthcare training.

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