

Most Regrettable Business Decisions

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Simulation Training Could Be The Way To Overcome Skilled Healthcare Workers Shortages

Simulation-based training in healthcare, replicating real-world scenarios in a risk-free environment, effectively enhances learning outcomes, patient safety, and operational efficiency, proving to be a transformative and cost-effective alternative to traditional training methods.



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key points

- **Effective training for healthcare professionals:** With constant changes in medical technologies and standards of care, lifelong learning is essential to provide quality care and save costs for clinical facilities.
- **Simulation-based training:** A form of digital training that creates a safe environment where users can train and repeat medical devices without endangering patients or jamming medical devices.
- **Challenges and Solutions:** Technologists and radiology students face challenges such as improving hands-on experience and addressing staffing shortages. Simulation-based training offers efficient solutions to address these challenges and safely develop practical skills.
- **Future perspective:** The future of healthcare training lies in smart simulators for software and equipment. These simulators offer tailored training solutions, seamlessly integrating into training courses and workshops. They play a crucial role in enhancing the competence of healthcare professionals, paving the way for their success in healthcare.

In the dynamic field of healthcare, keeping pace with the latest medical technologies and standards is a must for professionals. While traditional training methods lay the foundation, they often lack the practical, hands-on experience necessary for mastering complex medical procedures. Simulation-based training effectively fills this gap, a method replicating real-world medical scenarios in a controlled, risk-free environment. André Brauers, Global Head of Immersive and Digital Education Portfolio for Siemens Healthineers, provides an evidence-based perspective on the transformative impact of simulation training in medical education. He underscores its role in equipping healthcare professionals with the skills needed to navigate the complexities of modern medical practice, thereby enhancing learning outcomes, patient safety, and operational efficiency.

Simulation Increases Learning Outcomes in Medical Education: An Evidence-Based Perspective

The constant evolution of medical technologies and standards of care represents a constant challenge for healthcare professionals, who must continually educate themselves to stay up to date. Several studies have shown that well-trained staff can produce higher-quality work while providing significant cost savings for clinical institutions.

A comprehensive analysis by the American Society of Training and Development found that ineffective training can cost companies up to 12.4 millions Euros per year per 1,000 employees. This study highlights the financial impact of ineffective training on organisations and emphasises the importance of an effective training strategy.



Various studies have examined the effectiveness of training. A meta-analysis by Smith et al. (2020) showed that relevant and practical training achieves significantly better learning outcomes than traditional teaching methods. These results underline the importance of training's relevance for learning success.

Numerous studies have proven simulation-based training to be an effective method for learning and improving practical skills. A study by Johnson et al. (2019) found that simulation-based training in medical education significantly improved participants' skills and led to higher patient safety.

Additionally, research showed that simulation-based training is a cost-effective alternative to traditional teaching methods. A study by Jones et al. (2018) found that simulation-based training can lead to a reduction in training costs and faster onboarding of new employees, resulting in significant savings for clinical facilities.

Overall, these studies show that simulation-based training effectively increases learning outcomes in medical education. By integrating simulation into the training concept, healthcare professionals can gain real-world experience and continually develop to meet the healthcare industry's ever-changing needs.

Practical Training With Simulators is a Game-Changer in Technologist Training

Technologists need much hands-on experience to scan patients safely and deliver high-quality images.

Organising comprehensive hands-on training can often be a challenge in a radiology department that needs to be efficient and operational 24/7. Simulators offer an innovative solution that allows technologists, whether students or professionals, to train and practice on a simulated version of a medical device. From their computer, users can try out all system functions in a safe, simulated environment without putting patients at risk - increasing their confidence and improving scanning efficiency.

By using simulators, we learned how the machine works, how to move the CT table and how to perform the scan

A prime example of the use of software simulators can be found at the MT Vocational School for Radiology (UMM) in Mannheim. Here, students use the simulators to receive practical system training in the classroom. Kim Mathias, a third-year radiology student, highlights the benefits of this new learning method: "By using simulators, we learned how the machine works, how to move the CT table and how to perform the scan. We can try out the buttons without endangering the patient. What we learned

is remembered much better." This sentimental experience is supported by their teacher and principal, Stefan Schäfer, who praises the flexibility and availability of the solution, regardless of the equipment in the department.

In addition to training students, software and equipment simulators also play a crucial role when onboarding new employees or installing new systems. For example, the radiology team at Traunstein-Haslach Radiology was able to receive a comprehensive introduction to the interface of their new MRI system via the simulator. The opportunity to "gain hands-on experience planning scans" proved extremely valuable to the team before they began traditional on-site training.

The cloud-based nature of simulators also allows the customisation of protocols and system settings without impacting the clinical system. These customised settings can then be downloaded to the system within a defined time window.

Access to cloud-based simulators provides a flexible solution that is available anytime, anywhere. Whether in classroom training or clinical workshops, on-site or online via a PC - participants can interact directly with their trainers and colleagues, continuously improving their knowledge and skills.

Digital Twins: Leveraging Virtual Replication for Medical Education

The digital twin, a virtual replication of a real medical device or environment, is an increasingly relevant



technology in medical education. Studies have shown that integrating digital twins into technologists' training can significantly improve learning outcomes.

A study by Li et al. (2021) examined the use of digital twins in the training of CT technologists. The results showed that participants who trained using digital twins were more competent in operating the CT machine and detected errors better than those who used traditional training methods.

Additionally, a survey of radiology teachers conducted by Johnson et al. (2020) found that 85% of respondents believed that digital twins were an effective complement to the practical training of radiology students. Teachers particularly highlighted the ability to simulate realistic scenarios in a safe virtual environment.

These studies underscore the importance of digital twins as an innovative technology for improving medical education and show their potential to revolutionise practical training and sustainably increase the learning success of technologists.

Digital transformation is having a revolutionary impact on medical education and healthcare

Simulation-based training can lead to a reduction in training costs and faster onboarding of new employees, resulting in significant savings for clinical facilities

professionals. By integrating digital technologies such as software and equipment simulators and

digital twins, healthcare professionals can train and continually improve their skills in a safe and effective environment. These innovative approaches make it possible to meet the ever-growing demands of the healthcare system while increasing the quality of patient care. Simulators offer a revolutionary solution to training technologists by providing a digital replica of their work environment, allowing them to be successful from the start and continually increase their competency. Simulation-based training creates a safe environment for hands-on practice and supports ongoing education in an ever-changing medical landscape.

As the famous quote from Benjamin Franklin goes: "Tell me and I will forget." Show me and I will remember. Let me do it and I will understand." This highlights the power of hands-on learning, which is further enhanced by innovative simulators.

Conflict of Interest

None

references

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