Simulation: A Proven but Underutilized Education Method

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What is Simulation?

Simulation is an interactive teaching method that allows the learner to practice techniques and to apply knowledge in scenarios that would be experienced in the real world, in a controlled and safe environment. Unlike traditional approaches to professional education which are static in experience, focus more on knowing, and often provide little feedback, properly designed simulation programs are dynamic and designed using a decision-consequence model. At the end of the day, mirroring real clinical decisions with built-in feedback on those decisions increases the probability of better decision-making in real clinical practice (e.g. performance).

As a result of its engaging and consequence-driven characteristics, simulations have been extensively used in training and performance assessment in the fields of aviation, military, and healthcare for decades. These have taken on many forms including mannequins, models, and computer-assisted programs, each with its own challenges and opportunities. Table 1 presents a listing of the applications of simulation-based learning, current challenges and potential benefits.

Applications	Challenges	Benefits
• Develop new skills in a controlled environment, 'permission to fail' • Practice on high-risk or high-rate case scenarios and complex tasks • Correct actions/debrief on results after each simulation training, providing interactive training/ feedback • Tailor learning to individual needs • Facilitate team-based training and care delivery • Use of evidence-based strategies and/or real life cases	• Potential costly initial investment, cost, staffing • Equipment maintenance and repair • Space for training and equipment • Staffing skill development or hiring of appropriate staff • Technical support to maintain equipment	• Reduce risk and increase positive patient care outcomes to patients • Reduce errors in decision making • Minimize litigation risk and malpractice insurance

The challenges associated with simulation training tools have more recently been minimized with the development of new technologies, now making simulation-based learning more accessible to a wider pool of learners in healthcare.

Specifically, the healthcare industry has used simulation to demonstrate effectiveness in intensive training of high-risk fields. However, it is now being applied in a wide range of scenarios, including training on "softer" skills of demonstrating empathy and improving communications with patients, which may ultimately support better shared decision-making. It has proven to be a valuable low-risk tool for learning while providing high-yield in determining competency or the skill set of a provider. Moreover, the level of difficulty can be adapted to any situation, from simple training or problem solving to more complex analytic or diagnostic clinical skills development. Additionally, given the focus on "value-based care", through simulation activities, the tracking of costs and resources associated with learners' decisions brings relevance to the forefront.

> *"Making the patient the center of the learning experience and building the education around the process by which the patient is evaluated was very interesting. Being able to interrupt the process and provide them at that moment, where it is most relevant, with feedback or some background information to substantiate why we are asking them something or branch in a certain way, was very rewarding to me as an educator"*
>
> **- Clinical educator using Simulation**

Does Simulation Work?

According to numerous published studies, simulation is associated with significant positive effect on a learner's outcomes of knowledge acquisition, skills, and modest impact on patient health outcomes as compared to traditional approaches of education and training. The inherent factors or characteristics of simulation-based learning are highly associated with engagement and outcome. These attributes include:

- Ability to repeat actions and decisions
- Ability to train on a range of difficulty
- Ability to provide feedback, show consequences and offer corrective action
- Approximation to real-world scenarios

Personalized, Adaptive Feedback

A feature of simulation that is associated with improved learning and application is feedback. Through simulation activities, learners are provided feedback that can be associated with the consequences of their decision-making, thereby creating a personalized learning moment. The feedback is provided in context, increasing the learner's ability to understand, retain and apply that knowledge.

"There is nothing better than learning from your mistakes" - **Clinical educator**

Simulation as a Tool for Continuing Medical Education (CME)

The goal of CME is to translate evidence into effect and knowledge into practice. However, the existing literature, imperfect as it maybe, shows that passive educational activities are poor at improving clinical practice patterns. The evidence suggests that the most effective strategies tend to be highly interactive, provide multiple repetitive opportunities to engage in learning, and are aimed at the real tasks and decisions one makes in clinical practice. These strategies have often been time consuming, difficult and costly to implement across multiple practice settings and specialties. Simulation-based learning can be an innovative method and tool to address the barriers to known and effective educational strategies.

Featured Bonus

Additional application of simulations should also be considered.

1. **Patient Simulations**

   As CME providers are being challenged to provide more patient-centric education; patient simulations may offer the opportunity to inform and prepare patients as well. Patients can experience the consequences of their decisions on their health.

2. **Assessments**

   Simulation activities can be incorporated into provider performance evaluations as well as to identify current practice behavior along with practice gaps and needs.

Conclusion

Simulation-based learning is a proven method applied in many other industries to train professionals of all skill levels in decision-making, and tasks ranging from the simple to complex. Historically, the barriers to organizing and implementing simulations were costly and cumbersome, however changes in technology have allowed easier access to simulation-based training. Given the flexibility and the power to mirror real world issues, CME providers should consider simulation as a primary "go to" when designing performance-oriented programs to improve educational outcomes and identify gaps and needs. These topics will be explored in more depth in subsequent white papers.

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