Cleveland Clinic

Enhancing Simulation Scenario Development: A Human-AI Collaborative Approach

Stormy C. Sweitzer, PhD, MPH, MBA; Maureen Washock, BSN, RN, CPN, CHSE; Nichole C. Brown, PhD(c), MSN, RN, CHSE-A; Claude.ai

Simulation and Advanced Skills Center (SASC)

Simulation Showcase 2024

Background

- Simulation-based education has become a cornerstone of healthcare training, but creating high-quality, diverse scenarios remains time-consuming and resource-intensive. As well, simulation educators may struggle to develop scenarios that are both clinically accurate and educationally effective.

- The emergence of advanced generative artificial intelligence (AI) technology offers a potential solution to streamline this process while maintaining, or even enhancing, scenario quality.

- Members of the Simulation and Advanced Skills Center (SASC) and of the Office of Interprofessional Learning (OIPL) sought to employ this technology in creating a streamlined process for development of medical simulation scenarios.

- Our approach leveraged the strengths of the AI's ability to rapidly and effectively integrate educational standards and generate content and of our human expertise in clinical practice, simulation and interprofessional education, as well as problem framing & prompting.
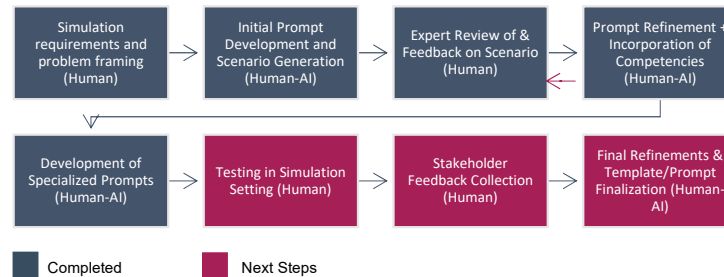
Contact information

Stormy Sweitzer, sweitzs@ccf.org
Maureen Washock, washocm3@ccf.org
Nichole Brown, brownn23@ccf.org

Description

Project Goals:

- Utilize generative AI to develop high-fidelity simulation scenarios
- Create flexible AI prompts for reliable future scenario generation

Process:

- Comparative analysis of outputs from generative AI platforms ChatGPT, Claude.ai, and Gemini; chose Claude.ai due to specificity
- Leveraged human expertise:
  - Simulation Center: Provided clinical and simulation expertise; ensured that the AI-generated content aligned with best practices in healthcare education and simulation design
  - Office of Interprofessional Learning: Provided interprofessional collaboration expertise; intermediary between domain experts and AI, by translating scenario/clinical needs into problem-frames and prompts
- Human-human and human-AI collaboration involving multiple cycles of discussion, AI prompting and refinement, and addition of competencies and principles (e.g., INACSL Best Practices for simulations, Medical Management principles, Interprofessional Core Competencies, HRO principles, and the Debriefing with Good Judgement framework) to guide generated outputs, with each iteration improving the scenario's quality and educational value.

Process flow diagram:
Simulation requirements and problem framing (Human) → Initial Prompt Development and Scenario Generation (Human-AI) → Expert Review of & Feedback on Scenario (Human) → Prompt Refinement + Incorporation of Competencies (Human-AI) → Development of Specialized Prompts (Human-AI) → Testing in Simulation Setting (Human) → Stakeholder Feedback Collection (Human) → Final Refinements & Template/Prompt Finalization (Human-AI)

Legend: Completed | Next Steps

Impact

Impact:

Our collaborative approach yielded several significant outcomes:

- A template to elicit desired scenario specifications and learning objectives
- A set of complex AI prompts designed to generate scenarios, as well as specifications for setting up the manikin & training environment, and a debriefing guide particular to the scenario
- Reduced scenario development time by at least 50% compared to traditional methods
- Improved alignment of scenario with educational objectives, incorporation of competencies, and scenario detail

Key insights:

- AI excels at rapid generation of scenario frameworks and consistent inclusion of clinical learning needs and requested competencies
- Human expertise and domain knowledge (e.g., clinical, educational) is crucial for ensuring clinical relevance and accuracy, reducing bias, adding nuanced details and a human touch, and aligning scenarios with broader educational goals
- The iterative process allows for continuous improvement of prompts and easy customization and adaptation of scenarios

Next Steps:

The outcomes of this project offer simulation educators an innovative workflow and set of prompts for developing high-fidelity scenarios and related simulation materials using generative AI. Next steps involve:

1. Testing scenarios in a training environment and using feedback to further refine and finalize prompts
2. Utilizing the process and prompts to inform future scenario development
3. Disseminating the outcomes of and work products (i.e., process and prompts) generated by these efforts within and beyond Cleveland Clinic

American Society of Anesthesiologists®
Endorsed Program
Simulation Education Network

AMERICAN COLLEGE OF SURGEONS · DIVISION OF EDUCATION
ACCREDITED EDUCATION INSTITUTES
ENHANCING PATIENT SAFETY THROUGH SIMULATION
Accredited Education Institute

SSH
Society for Simulation in Healthcare
Accredited Program
Assessment, Research and Teaching/Education